NETWORK WORLD
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TI to market data access software tool

By Wayne Eckerson
Senior Editor

PLANO, Texas — Texas Instruments, Inc. is planning to sell a data access product it developed internally that enables various application development tools to import and process data from multiple, heterogeneous databases throughout a corporate network.

TI, which has more than 10,000 personal computers, created the PassageWay program so developers could use the tools of their choice to build applications capable of accessing any data source in a company.

"PassageWay was developed to attack the problem of enterprise integration," said Syd Limerick, manager of PassageWay in TI's Information Systems Services division here. "We saw the need for software that would get information to the right place in the right format so it could be used by any of the new client/server development tools coming out."

TI plans to begin beta-testing a commercial version of Passage-

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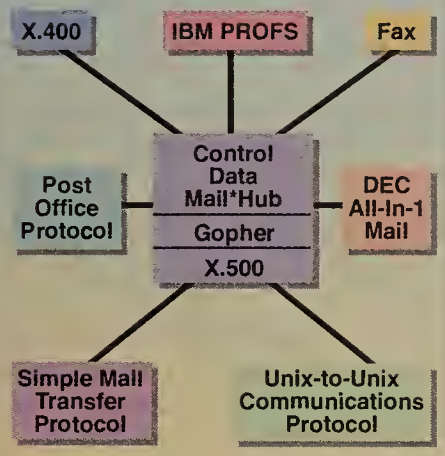
Mail integration brings technology to the masses

Lee Croatt
Director of computing and information resources



The University of Minnesota's new E-mail system features an X.500 directory and the school's Gopher user interface.

GRAPHIC BY SUSAN SLATER

SOURCE: CONTROL DATA SYSTEMS, INC., ST. PAUL, MINN.

Friendly 'Gopher' reduces complexity of messaging

By Ellen Messmer
Senior Correspondent

MINNEAPOLIS-ST. PAUL — Hoping to end the protocol wars while making electronic mail easier to use, the University of Minnesota has implemented an X.400 mail hub here that links a gaggle of proprietary systems and supports an X.500 directory.

Up and running since October, the X.400 hub from Control Data Systems, Inc. unites half a dozen older incompatible E-mail systems, supports access to the Internet and public carriers, and can provide as many as 100,000 students and faculty with native X.400 E-mail.

Adding its own personal touch to the Control Data Mail*Hub, the university has included Gopher, the popular Internet search and retrieval software it invented, as the user interface to the X.500 directory.

"We made a strategic decision that if we wanted to bring the overall technology of the campus

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AT&T adds array of high-speed net links

Family of fractional T-3 services offers users new options for internetworking, other applications.

By Bob Wallace
Senior Editor

BASKING RIDGE, N.J. — AT&T last week announced a family of fractional T-3 services designed to fill the void between its T-1 and T-3 network offerings.

The new Accunet Fractional T45 services will be available in the first quarter of 1993 at speeds of 4.6M, 6.2M, 7.7M and 10.8M bit/sec, which AT&T said meet requirements for the latest generation of bandwidth-intensive applications. Additional speeds are being considered.

"We surveyed our user group and found that about 70% [of the respondents] expressed interest in services that would run between T-1 and T-3," said Hemant Vaidya, division manager for AT&T's Accunet Digital High Capacity Products. "The timing was right."

Users agreed. "Fractional T-3 is good for the industry because it gives users more options in building and optimizing wide-area networks," said Michael Kilbane, general manager of systems development at Diamond Shamrock Refining and Marketing Company, Inc. in San Antonio, Texas. "There are companies out there with heavy-duty applications that need this amount of bandwidth."

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INSIDE

- Distributed database management systems still have a ways to go in meeting users' needs to transparently access and update data at multiple sites. Page 43.

- Cheyenne Software, Inc.'s InocuLAN goes to battle on the side of servers in the war against viruses. Results are detailed in latest ICSA Network Security Test Series article. Page 45.

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IDEAS DELIVERS middleware to ease the task of building TCP/IP-based client/server networks. Page 4.

ALLIANCE VOWS crackdown on stolen software delivered via bulletin boards. Page 8.

NEWSPAPER

Nagging questions tarnish allure of 800 portability

By Anita Taff
and Bob Brown
Network World Staff

NETWORK WORLD'S
R.A.F.
READER ADVOCACY FORCE

It's ironic that users were the chief advocates behind the FCC's decision to delay 800 portability.

After all, portability promises to loosen AT&T's stranglehold on the toll-free market, giving users new flexibility in 800 routing and redundancy.

But the effort is plagued by problems and questions that must be resolved by the Federal Communications Commission and carriers before portability becomes a reality. Among other things, there are concerns about the vital Signaling System 7 (SS7) links among local and long-haul carriers and confusion about backup plans if new 800 database technology fails.

In addition, portability won't be ubiquitous and it's unclear what extra charges the local carriers will levy on users for supporting it.

In its eleventh-hour decision late Nov. 20, the FCC gave the industry more time to deal with those problems, ordering a delay in the scheduled implementation of

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Carriers plan pan-Europe ATM network

By Bob Wallace
Senior Editor

Five European carriers last week detailed plans to construct a pan-European Asynchronous Transfer Mode (ATM) network to provide high-speed services to multinational companies.

British Telecom International, France Telecom, Spain's Compania Telefonica Nacional de Espana, Germany's Deutsche Bundespost Telekom and Italy's Asst/Stet have agreed to build the wide-area ATM net that may be ready to support services with speeds of more than 2.048M bit/sec (E-1) in a little over a year.

The carriers next year will begin testing the network, which will be based on switches from several vendors that conform to

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Vendor group proposes standard file-transfer API

Would let users port applications without modifying them to work with diverse file-transfer programs.

By Michael Cooney
Senior Editor

GAITHERSBURG, Md. — The ability to migrate applications from one file-transfer environment to another without having to alter the programs may become possible next year if a new application program interface is adopted by the Institute of Electrical and Electronics Engineers, Inc.

A consortium of vendors, including Tandem Computers, Inc., Systems Center, Inc. and Unisys Corp., will propose a new File Transfer API (FTAPI) at an IEEE Open Systems Interconnection implementors workshop here on Dec. 14.

If adopted, vendors could write FTAPI code on top of their existing file-transfer products, resulting in a common application interface across a variety of system platforms.

This would make it possible to port applications from one operating system environment to another without having to revise the programs to use the different file-transfer products supported by the new system.

"If users switch hardware or software vendors today, they

(continued on page 8)

IBM gives its multivendor network plan the hard sell

MPTN is key to realization of net blueprint goals.

By Michael Cooney
Senior Editor

IBM has never been accused of making it easy to integrate Systems Network Architecture traffic with other net environments, but the firm hopes to change that with its emerging Multiprotocol Transport Network (MPTN) specification.

IBM is quietly pitching MPTN to third-party vendors, standards bodies and users as the best way to build multivendor applications that can use various common underlying transport protocols.

MPTN fulfills the objectives of the Common Transport Semantics layer of the Networking Blueprint IBM announced in March. The blueprint defines how IBM will integrate local- and wide-area networks and grow large distributed enterprise nets and applications. MPTN is the glue that binds the blueprint's wide-ranging technologies and strategies.

MPTN is a software layer that sits between the data transport and session layers. It includes application program interfaces that enable applications to use any supported transport protocols.

The main idea behind MPTN is that users of SNA- or non-SNA-

(continued on page 30)

Users pen net management requirements document

By Bob Brown
Senior Editor

BERNARDSVILLE, N.J. — The Network Management (NM) Forum's User Advisory Council (UAC) plans to announce soon a new user-written document designed to establish a set of priorities for vendors of network and systems management products.

The "Statement of User Requirements for Management of Networked Information Systems," an early copy of which has been obtained by *Network World,* is based on interviews with managers at some of the largest user organizations in the world. The document, which has been in the works for more than a year, can be employed by users to help plan net management strategies and by vendors to help design products.

"By giving vendors a better understanding of the way that our organizations operate, we'll give the most imaginative vendors the opportunity to solve our problems by helping us to manage the process, not just by providing us with the newest black box," said Ron Scott, UAC chairman and section head for telecommunications operations at Ontario Hy-

(continued on page 8)

Briefs

IBM forms new client/server unit. IBM last week launched a new Client/Server Computing (C/S) business unit to help its eight other business groups develop, plan, implement and build client/server products and services. C/S will also set up client/server customer centers worldwide where users can test proposed configurations. Heading up C/S will be Thomas Furey, general manager of the Purchase, N.Y.-based unit. IBM said the new group will have more power and financial resources than the Client/Server Computing Group formed in April 1989. That group's functions have been dispersed among IBM business units over the past year or so.

NM Forum names new officers. The Network Management Forum last week announced a slate of newly elected officers. Keith Willets of BT will continue as chairman, treasurer Gary Francis of IBM will swap jobs with AT&T's Bill Gilbert, president of the group, and John Kitchener of GPT, Ltd. will take over the secretary position from Hewlett-Packard Co.'s Bob Emerson.

Northwestern dials up AT&T. Northwestern Mutual Life Insurance Co. will use AT&T's InterSpan Information Access Service (IAS) to give 1,500 personal computers the ability to dial up host applications at its Milwaukee home office and at Robert W. Baird & Company, Inc., its brokerage subsidiary. IAS gives employees a toll-free seven-digit number (950-1288) for asynchronous access to AT&T's packet-switched network, replacing hundreds of local telephone numbers.

DAL for DEC to debut. Pacer Software, Inc. this week will unveil an Apple Computer, Inc. Data Access Language (DAL) Server for Ultrix-based DECsystem servers. The DAL Server will give Macintosh client applications access to Ingres Corp., Informix Software, Inc., Oracle Corp. and Sybase, Inc. databases on the DEC servers. Available now, DAL Server is priced from $4,000 for 16 users to $12,000 for an unlimited number of users.

Cellular industry rings up 10 millionth user. The cellular telephone industry has signed on its 10 millionth customer, the Cellular Telephone Industry Association announced last week. In its nine years, the industry has created about 100,000 new jobs, invested nearly $10 billion in plant equipment and produced a positive balance of trade in its sector by exporting U.S. cellular technology abroad.

Patent infringements? AT&T last week said it has notified MCI Communications Corp. and the Canadian consortium, Stentor Resource Centre, Inc., that their proposed use of MCI's intelligent network software in Canada may infringe on AT&T's Canadian patents for virtual private nets, 800 services and credit card calling. AT&T has asked the Federal Communications Commission to determine if the MCI-Stentor agreements violate its policy against exclusive arrangements between U.S. carriers and foreign phone companies.

D&B ports wares to Unix. As part of an ongoing plan to offer downsized versions of its mainframe applications, Dun & Bradstreet Software last week announced that its mainframe-based general ledger, accounts payable and currency management software is available on Unix platforms from Data General Corp., Hewlett-Packard Co. and ICL North America. Pricing begins at $43,000 for general ledger and currency management, and $41,000 for accounts payable.

CONTACTS

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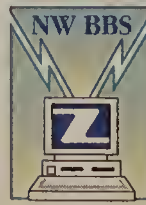

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Carriers get reprieve as FCC delays 800 portability

Technology cutover set to start after holidays.

By Anita Taff
Washington Bureau Chief

Big 800 customers last week breathed a sigh of relief in response to the FCC's decision to delay 800 portability.

Bowing to user concerns, the Federal Communications Commission on Nov. 20 pushed back the deadline for portability from March 3 to May 1, 1993, and ordered carriers to delay cutting over technology needed to support portability until January.

Users had expressed fear that a rush to meet the original portability schedule would lead to network performance problems and even outages. Users were particularly concerned that carriers would undertake most of the cutover to new 800 database technology during the busy holiday season.

James Blaszak, counsel for the Ad Hoc Telecommunications Users Committee, called the FCC's decision "a prudent and reasonable compromise." The order addressed the Ad Hoc Committee's top concern that call setup time not increase as carriers begin cutover to 800 database technology.

"The FCC said it expects [Signaling System 7] interconnection to be done before carriers use the database for routing purposes, so call setup times should meet the FCC requirements," Blaszak said.

Ron LoRusso, director of voice communications at Revlon, Inc. in New York, also applauded the FCC move. "Since we waited this long, I'm all in favor of rolling back the date to make sure the conversion goes smoothly."

The committee asked the FCC in early September to force local carriers to delay cutover to 800 database technology until the first quarter of 1993. Later that month, a group of financial firms asked that the deadline for portability be pushed back until June so that a host of technical, administrative and procedural problems could be ironed out.

After it became apparent at a meeting this month that some regional Bell holding companies were not on schedule and were under pressure from users, the FCC granted the delay.

"While the LECs [that had fallen behind] are actively seeking to make up lost ground and maintain it is possible to do so, [they] would have to proceed under extremely tight deadlines with little or no tolerance for error or delay in order to effect a seamless transition . . . by March 1993," the FCC stated in its order.

Even before the FCC decision, some carriers — Ameritech, GTE Telephone Co., Pacific Telesis Group, Southwestern Bell Corp. and US West, Inc. — had voluntarily agreed to delay or limit cutover to new database technology until January. Bell Atlantic Corp., BellSouth Corp. and Nynex Corp. have already proceeded with cutovers in a number of their offices during the fourth quarter.

AT&T, which has 80% of the 800 market and stands to lose the most from portability, supported efforts to delay the deadline. "AT&T is extremely gratified that the commission agreed with customers and us that the risks associated with making changes to the network during the critical fourth quarter far outweigh a slight delay," an AT&T spokesman said.

MCI Communications Corp. said it will continue its media blitz touting the benefits of portability in spite of the decision. Daniel Akerson, president and chief operating officer at MCI, said the carrier believes the original date was achievable but understood the desire to avoid risk.

"We are pleased the FCC specified only a short delay, assuring the benefits of portability will reach customers as rapidly as possible," he said.

The RBHCs expressed little resistance to the delay. "The delay will allow us to better coordinate our database conversions with our SS7 implementation," said Dan Winters, product manager for 800 database at Southwestern Bell Telephone Co. "That will minimize the impact to subscribers regarding call setup times."

BellSouth said it will discontinue cutover to the new technology. "Since the commission determined that a delay is appropriate, we won't oppose it," a spokeswoman said.

Nynex officials said the delay may be helpful in getting tariffing tasks accomplished but its network would have been ready. "We have a lot of disappointed people who were geared up," said Chris Jones, Nynex's 800 database access product manager.

Wellfleet to offer SNA enhancement

By Maureen Molloy
Senior Writer

BEDFORD, Mass. — Wellfleet Communications, Inc. last week announced a bevy of new features that will give its multiprotocol routers improved support for IBM Systems Network Architecture traffic.

The router software, to be released in two installments, will support Transmission Control Protocol/Internet Protocol encapsulation of SNA data, reduce overhead across wide-area links and enable users to give SNA data priority over other traffic.

Wellfleet further outlined its long-range SNA strategy, which includes key features such as local termination of SNA sessions and a reduction in Network Basic I/O System broadcast overhead. Finally, Wellfleet pledged compatibility with IBM's Data Link Switching (DLS) and Advanced Peer-to-Peer Networking (APPN) Network Node implementations.

The initial round of enhancements will be available by year end in release 7.50 of Wellfleet's software, which runs on its entire line of routers. Included is SNA/IP Routing, software that swaddles SNA packets in a TCP/IP envelope for transmission across the internet. That will aid in overcoming many of the deficiencies inherent in IBM's Source Route Bridging (SRB) protocol, such as its seven-hop maximum, said Karen Barton, Wellfleet's director of strategic business development.

Another new feature, called Directed Explorers, works hand in hand with SNA/IP Routing to reduce source routing broadcast traffic on wide-area links. Rather than using discovery packets to determine paths through the net, the feature gives the router the ability to dynamically learn the location of end stations and filter out superfluous overhead traffic.

A key element of SNA/IP Routing is that it utilizes the Open Shortest Path First (OSPF) protocol to prevent SNA sessions from being disrupted when a net failure occurs, Barton said. Unlike SRB, which requires end stations to find an alternate path, OSPF enables routers to find new paths fast enough to prevent SNA sessions from timing out.

Giving SNA first priority

Wellfleet's Version 7.60 router software, which will be available by early next summer, promises to let users give SNA priority over other local-area network-based protocols. This will help users merge SNA and multiprotocol backbones without sacrificing the deterministic response time that

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Middleware offers server link options

By Wayne Eckerson
Senior Editor

COLUMBIA, Md. — Ideas, Inc. last week announced middleware that makes it easier to build highly available client/server applications in heterogeneous computing environments.

Called Network Broker, the software ties together distributed applications developed using Ada, a programming language used heavily by the Department of Defense and its suppliers. Releases due out next year will also support applications written in C and C++.

> "All the underlying communications is handled by the virtual network."
>
> ▲▲▲

Network Broker provides an application program interface (API) that enables developers to link clients to multiple servers on Transmission Control Protocol/Internet Protocol networks.

The API, which consists of eight verbs and 10 error conditions, hides the complexity of network communications from application programmers, making it easier to develop sophisticated client/server applications, according to Mike Dalpee, director of software engineering for Ideas here.

"Network Broker allows programmers to develop distributed applications with a high degree of availability with just a few hundred lines of code rather than tens of thousands of lines of code," Dalpee said.

Network Broker runs on Digital Equipment Corp.'s DECstations running Ultrix, DEC's VAXstations running VMS, IBM's RISC System/6000 running AIX, The Santa Cruz Operation, Inc.'s SCO Unix, Data General Corp.'s AViiON running DG-UX, Sun Microsystems, Inc.'s SPARCstations running Solaris, and Rational, a hardware and operating system designed specifically to run Ada programs.

Besides TCP/IP, Network Broker suports Unix interprocess communications and VMS mailbox for linking client/server applications within the same machine.

Unlike most middleware, Network Broker allows clients to access one or more servers without knowing where the servers reside or how to connect to them. For example, clients can issue requests in round-robin fashion to a number of servers performing the same services. Or clients can request services from the first available server or broadcast requests to all available servers.

This improves application performance by taking advantage of the processing power of multiple servers. It also increases availability by providing clients automatic access to alternate servers in case a primary server goes down, Dalpee said.

Network Broker consists of a domain naming server and one or more distribution agents. The domain naming server, which runs on one machine in the TCP/IP network, knows the location of all clients and servers.

The distribution agents, which can run on any machine in a TCP/IP network that is supported by Network Broker, manage communications between clients and servers. Client/server applications register with a distribution agent, which then knows the type of clients and servers that are on the network and what services each server provides.

Distribution agents

Clients issue requests to the distribution agent, which calls the domain name server to determine the network addresses of the server or servers involved in the transaction. Distribution agents then set up the communication link between the two applications and manage the flow of information from the client to the server and back again.

Distribution agents also hand off requests to one another when clients need access to services provided by servers registered with another distribution agent server.

In this case, distribution agents still call the domain naming server to determine the network address of the other distribution agent.

"Clients don't have to know where servers are to communicate requests, and servers don't have to know where the originating client is to send back a response," Dalpee said. "All of the underlying communications is handled by the virtual network."

Available now, Network Broker costs $1,495 for each personal computer node and up to $14,995 for each mainframe class computer. There is also a charge for each distribution agent, which ranges from $200 to $900, depending on what class machine the distribution agent resides on.

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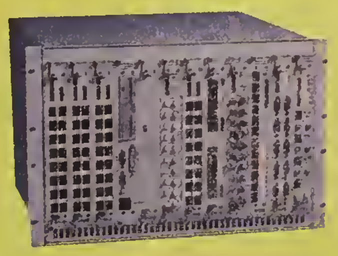

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Questions tarnish portability

continued from page 1

800 portability from March to May 1993 and telling carriers not to cut over new technology needed to support portability until after the business-critical fourth quarter (see "Carriers get reprieve as FCC delays 800 portability," page 4).

While the delay provides some breathing room, the FCC now has to ride herd on the carriers — several of which were struggling to meet the original deadline — to hit the new target for portability. More important, it has to work with local carriers to ensure that the problems flagged by users are resolved prior to May 1.

Ellen Block, a Washington, D.C. attorney who works with users on 800-portability issues, said the risks associated with portability today are too high and the FCC must act. "The phone companies don't have their act together; it's like a horror movie," Block said.

Benefits and risks

There is a good deal at stake for users in the success of 800 portability. Portability will allow users to switch 800 traffic to a new carrier, while retaining the toll-free numbers their customers know. Users will also enjoy a number of new routing options that allow them to split traffic among carriers at different times of the day or week, or by geographic area. These features will help control costs, balance traffic and aid in backup.

But there are concerns about the technologies that must be in place for portability work. Today, calls are routed to the correct carrier based on the first three digits of the 800 number — a system known as NXX routing.

Under portability, information about the carrier associated with a particular 800 number will be stored in a database that local carriers will query over SS7 links.

SS7's out-of-band signaling should ensure that database lookup doesn't add to call setup time, and the FCC has mandated strict performance standards that the carriers must meet under its portability plan.

But carriers and users know only too well that SS7 is far from foolproof. AT&T and several of the regional Bell holding companies have been hit hard by glitches in their SS7 software.

In the past, SS7 outages were isolated to individual carriers. But interconnection of signaling nets required for portability raises the specter that one carrier's problem could spill over into the network at large.

And some users, as well as AT&T, say it isn't clear how well SS7 will respond to the increased traffic from 800 portability.

The database system is also cause for concern.

Under the current plan, local carrier switches would access information in a primary database located in Kansas City, Mo., with a backup system in St. Louis. While it's unlikely both would fail, it's not impossible. And it is not clear the systems are as well protected as they need to be. For example, the primary system has emergency backup power, but the alternate system does not.

Also, software that allows local carrier switches to access the database must be installed and tested in hundreds of sites.

If the SS7 network fails or if the database system is knocked out or programmed improperly, 800 calls would be blocked or routed to the wrong long-haul carrier only to be dropped or answered with a recording.

Mike Sellitto, manager of telecommunications at Rich Products Corp. of Buffalo, N.Y., said 800 service is the lifeblood of his firm and he worries about the technical problems that may crop up.

"To change, even for big cost [savings], would be very tough, given the technical uncertainties," he said. "We'd rather stick with a higher cost service than be disruptive to our customers."

Local and long-haul carriers insist there will be adequate redundancy in place and enough testing done on the database and signaling technology to ensure disasters don't happen.

A Pacific Bell official said the SS7 net, which uses specialized processors known as signal transfer points (STP) and signal control points (SCP), ensures a high level of redundancy.

"We've installed mated pairs of SCPs and STPs to make sure that if anything goes awry, we can recover quickly," said Kathy Anderson, director of SS7 infrastructure.

But carriers have their work cut out for them converting trunks to support SS7. Some users fear carriers are rushing through conversion and not leaving enough time for testing.

The number of trunks to be reconfigured ranges from a low of 87,752 for Southwestern Bell Corp. to a high of 198,769 for Ameritech. Most carriers report they have converted between 30% and 60% of trunks, but Southwestern Bell had converted only 7% in early November.

Henry Levine, a telecommunications attorney in Washington, D.C. who counsels numerous corporate clients, said users are already beginning to report performance problems. "There's a problem of rolling brownouts being experienced by people who have very large 800 nets that go nationwide," he said.

Levine said users are meeting with carriers to determine whether the service losses are related to trunk conversion or any other aspect of 800 portability.

Cover me

Concerns about network or database glitches or outages are heightened by the apparent confusion about the backup system that will be in place after portability is achieved.

During the cutover phase, RBHCs will keep NXX routing capabilities in place as a fall back, but if a switch fails and 800-routing information has to be reloaded, that could take hours.

"There are no specifications for the fall back, including how long it will be there, what size failure or what kind of failure would trigger it," Levine said. "All of this could vary by [RBHC]."

After May, NXX routing probably won't be an option.

"If things don't work, what happens?" Block asked. "The answer is different no matter who you talk to at each [RBHC]."

Sue Platner, director of access product management at Ameritech Services, Inc., said most carriers will dismantle the NXX system after converting to 800 database. She said Ameritech will probably only leave the dual systems in place for 24 hours after conversion.

But she and other carrier officials insist the new system will be bulletproof due to the reliability of SS7 and the plans carriers have in place for redundancy.

Falling back to the NXX system wouldn't even work unless every RBHC was using it.

Chris Jones, 800-database access product manager at Nynex Corp., said, "Once we do conversions, we could not revert [to NXX]. We're building diversity into the net for redundancy."

Jim Spurlock, special assistant to the chief of the FCC's Common Carrier Bureau, said the FCC is "not looking at putting any additional routing diversity requirements on the carriers but will be very watchful to make sure all safeguards are in place."

The new 800 system will be dependent on the SS7 networks, even though there have been problems with SS7 nets in the past, he said. The FCC has ordered carriers that have had SS7 net problems in the past to file plans on how to fix those problems and has been satisfied with the performance of SS7 since then, he added.

What'll it cost me?

Another concern is what portability will cost. Carriers expect to charge a fee each time an 800 number is looked up in the database, but they haven't filed tariffs yet and it is unclear what charges they'll levy.

"We're about to order this service, and we don't know what it's going to cost us," Levine said, adding that the new technology being installed will actually make RBHC operations more efficient and, if anything, carriers should pass any savings on to users.

BellSouth supports a two-tiered charge for queries to the database, said Whit Jordan, director of federal regulation at BellSouth. One fee would cover basic queries needed to route calls from the local to the long-haul carrier and another would cover more complex features such as time-of-day routing.

Both Nynex and Pacific Bell said they're waiting for FCC guidance on the pricing issue.

Ron LoRusso, director of voice communications at Revlon, Inc. in New York, said he is looking forward to 800-number portability but has enough concerns about its implementation that Revlon "will not be the first one on the block to try it."

Revlon has moved some of its major call centers to locations such as Oxford, N.C., where telephone service is provided by independent local carriers.

"We are concerned that if we were to change long-distance carriers for 800 service that the small phone companies might not be ready to handle the change," LoRosso said.

Patchwork of technologies

The FCC's portability order only requires the RBHCs and GTE Telephone Co. to install 800-database technology. Many independents want to install the technology, too, but there is no deadline for them.

That could lead to a patchwork of network technologies. Calls in independents' regions may be handled by the old NXX system or routed through the new database, but with longer call setup if the independent doesn't have SS7 throughout its net.

The bottom line

In order for users to reap the benefits of portability, it's clear the FCC has to take a leadership role in the critical months before cutover to 800 portability.

The agency's order delaying portability was the right move, striking a balance between the need to get portability in place and user concerns.

Now, the agency has to ensure an orderly cutover to SS7 that doesn't allow carriers to leave a significant amount of work until the last minute and requires an appropriate level of testing of new signaling links. The FCC should also work with carriers to clearly define and enunciate a backup plan should problems arise after May 1.

In addition, the FCC has to develop a common understanding of what charges, if any, the carriers will be able to levy for database access under the portability plan. Pricing should take into account what carriers will save over the long term by installing new signaling technology.

Levine said users are meeting with carriers to determine whether the service losses are related to trunk conversion or any other aspect of 800 portability.

▲▲▲

The agency could also get users more involved in the process. Currently, the FCC oversees a monthly meeting of long-distance and local carriers to discuss progress on portability. A few users have been allowed to sit in, but the FCC ought to make available, either in paper or electronic form, information about the problems discussed and the steps being taken to resolve them.

Spurlock said he was unaware of this issue being raised to the FCC, but he said the commission would consider addressing the issue if users so requested.

Currently, users that are seeking answers to their concerns have to set up individual meetings with FCC staff or commissioners to get information.

"There is a big challenge ahead for the FCC," said David Yedwab, a vice-president at The Eastern Management Group, a market research firm in Parsippany, N.J. "[Network managers] must be able to plan to use the features and capabilities to provide the most reliable and effective 800 services in the electronic storefront of the '90s." ◘

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Trade group takes aim at BBS villains

By Ellen Messmer
Senior Correspondent

WASHINGTON, D.C. — The Business Software Alliance (BSA), a trade association that combats software piracy, last week promised to mount a worldwide crackdown on electronic bulletin board systems that disseminate stolen software.

BSA President Robert Holleyman said the association, which includes Apple Computer, Inc., Microsoft Corp. and Novell, Inc., is targeting bulletin board systems because they appear to be a growing source for the distribution of stolen software. The BSA was behind a German police raid of 13 bulletin board systems on Oct. 28 in Berlin, Holleyman said, an action disclosed by German authorities only last week.

The Berlin midnight sweep netted more than 250 allegedly stolen software programs. Although information on the exact software programs has not yet been made available, much of it is believed to have originated from bulletin board systems in the U.S., Holleyman said. BSA believes more than 100 other bulletin board operators in Europe may be involved in illegal distribution.

The BSA initiated its first legal action in the U.S. against the Baltimore-based APL bulletin board system. On Oct. 1, the U.S. Federal Marshal raided the APL and seized $100,000 worth of allegedly illegal software. Now shut down, the APL is being prosecuted under civil law by BSA on behalf of Aldus Corp., Autodesk, Inc., Lotus Development Corp., Microsoft, Novell and WordPerfect Corp., all BSA members.

A new U.S. criminal law that went into effect this month, the Software Copyright Protection Bill, will give the BSA new clout in prosecuting software pirates.

The law makes willful violation of software copyright law a felony, rather than a misdemeanor as was previously the case. Under the new law, illegally making 10 or more copies of a software program valued at $2,500 or more and selling the bootleg versions for profit is punishable by a maximum fine of $250,000 and five years in jail.

(continued on page 63)

Users pen net mgmt. document

continued from page 2

dro in Toronto.

The document will also help users crystallize their thoughts about network management, said Jim Moorhouse, who heads the UAC's working group for developing user requirements and is Motorola, Inc.'s manager of network management architecture and strategies in Schaumburg, Ill.

"It will be good for users that want to do a sanity check on what they are trying to accomplish with network management by seeing what other large companies are doing," Moorhouse said.

The document includes a section detailing the capabilities that network management products must provide and a description of the typical processes by which management systems and personnel communicate.

Users set net management priorities

Sampling of items from User Advisory Council's User Requirements document

General function requirements

- ☐ Manager-to-manager and manager-to-agent information exchange
- ☐ Directories

Configuration management

- ☐ Ability to define network objects and their attributes manually, via autodiscovery or by other means
- ☐ Mechanisms to query objects and their attributes
- ☐ Ability to distribute software across a network

Fault management

- ☐ Event and error logs
- ☐ Activation of predefined diagnostic and testing procedures
- ☐ Automatic generation of trouble tickets
- ☐ Correlation of alarms

Security management

- ☐ Access control on networkwide and subnet basis
- ☐ Encryption

Performance management

- ☐ Performance monitoring
- ☐ Predefined performance tests that can be manually executed upon indication of unusual network condition

Accounting management

- ☐ Collection and reporting of accounting information such as user network connection time
- ☐ Ability to set and change accounting limits

GRAPHIC BY SUSAN SLATER

SOURCE. NETWORK MANAGEMENT FORUM, BERNARDSVILLE, N J.

It also summarizes the general functional requirements of a network management system, including those regarding configuration, fault, security, performance and accounting management (see graphic, this page).

The functional requirements listed in the document were derived by examining how multiple levels of network and systems management support personnel interact in different organizations to process management information, said Bruce Morrell, vice-chairman of the UAC and manager of strategic communications at EDS Corp. in Dallas.

"By giving vendors a look at the processes used by network operators to provide services to end users, we have a better chance of seeing management products developed that will benefit end users," Morrell said. "Too many times, network management products are optimized for operators, not end users."

For example, he said, a company that buys multiple proprietary management systems to monitor different devices may find its net managers are satisfied, but the management team will appear disjointed to the end user calling a support staffer for help.

Tom Nolle, president of CIMI Corp., a Voorhees, N.J., consultancy, said users should consider employing the document when writing requests for proposal.

"Most management systems are put together by a bunch of techies saying, 'Wouldn't it be neat if we could do X?' Nolle said. "No one has really ever paid a great deal of attention to whether or not X would be useful in a user management application context, but this document should help vendors do that."

Bruce Murrill, the NM Forum's technical director, said the document "gets users to start thinking about what they are trying to do and process.

"If you can get a series of processes in place that represent a standardized way of doing things, the marketplace will do a better job of addressing your needs," Murrill said.

The document is available for $25. For more information, call the forum at (908) 766-1544.

TI to market data access tool

continued from page 1

Way in April and release the initial version late next year.

According to Limerick, PassageWay is a blend of a data access tool and an application development environment. Besides managing data access, PassageWay lets developers process retrieved data so that it can be used effectively in client applications.

For example, developers working in Microsoft Corp.'s Visual Basic can use PassageWay to retrieve, consolidate and translate data taken from a variety of sources and insert it directly into a Windows spreadsheet supported by Visual Basic.

PassageWay works with any client/server development tool or application through an interface written in C. Developers can also call PassageWay using Dynamic Data Exchange or access it using Dynamic Link Libraries.

The current version of PassageWay supports a fourth-generation language, but TI plans to incorporate point-and-click visual programming tools.

PassageWay has a simple application program interface (API) composed of nine verbs that developers can use to access a variety of databases, including Oracle Corp.'s Oracle Server, Sybase, Inc.'s SQL Server, Lotus Development Corp.'s Notes and mainframe databases such as DB2.

The current version supports Windows and OS/2 clients as well as OS/2 servers. When released commercially next year, PassageWay will also support Unix clients along with Unix and Windows NT servers, Limerick said.

Sue Green, marketing manager of client/server computing tools at TI, said PassageWay incorporates third-party middleware product that enables it to ride on top of most networks.

Green said TI is currently negotiating with an undisclosed middleware vendor whose product would be bundled into the commercially available version of PassageWay.

PassageWay, which was developed in C++ and exhibits many object-oriented characteristics, consists of two components — a data collector and a shared data manager. The data collector is the underlying data access logic represented by the nine API verbs. It allows developers to use any front-end development tool to access and retrieve data within databases supported by PassageWay.

"Developers use the same API whether they are going after SQL data on the mainframe or Unix server or pulling data from 3270 screens," Limerick said.

The shared data manager applies business rules or other application logic to the data gathered by the data collector, Green said. Developers can use the shared data manager to translate data into different application formats, perform error checking or apply some other business rules.

"Shared data manager allows developers to pluck a field from a VAX-based transaction and a field from an SQL database and combine them into a format that is compatible with the front-end application," Limerick said.

Group proposes file-transfer API

continued from page 2

have to rewrite all of their file-transfer applications to their new vendor," said Joe Mohen, vice-president of strategic planning for mainframe communications software maker Proginet Corp. in Uniondale, N.Y., a backer of the FTAPI proposal.

"There is no general-purpose file-transfer API on the market, and we think FTAPI will fill that tremendous void," Mohen said.

Application portability is the primary function users want, said Ed Kelly, manager of FTAM products for Unisys and editor of the FTAPI standard.

"It's important to those users looking to downsize from mainframe to Unix networks," he said. "With the new interface, they could take their file-transfer applications with them."

Experts said FTAPI will also offer users a method for migrating to new file-transfer protocols while retaining their existing programs. Another benefit is that users will not have to train operators in order for them to work with different protocols, according to Kelly.

While the idea of FTAPI is not an entirely new idea, other generic APIs have not been widely implemented, Mohen said. For example, the X/Open Company, Ltd. has done some work on common file-transfer APIs.

According to Tim Boland, acting chairman of the IEEE 1238 group that will hear the FTAPI proposal, the X/Open work could be implemented in the FTAPI proposal. However, he said it is too early to say exactly how that would work. The group is responsible for the development of standardized APIs. "No official action has been taken on the FTAPI yet, but it is on the agenda for the [Dec. 14] meeting," Boland said.

According to the vendors, if the IEEE accepts FTAPI now, it will come up for a vote at the IEEE's regular meeting in March. If it is then approved as a standard, users could expect products conforming to it by the end of next summer.

DATA NET ARCHITECTURES

NETWORK ARCHITECTURES, DATA NETWORK EQUIPMENT, STANDARDS AND ENTERPRISE NETWORK MANAGEMENT

Worth Noting

> "This is not your father's 3174."
>
> **George Mills**
> IBM's product planning manager
> for establishment systems
> Talking about the evolution
> of the IBM 3174 controller

Data Packets

JetFax, Inc. of Menlo Park, Calif., has unwrapped a network faxing system for Microsoft Corp.'s recently announced Windows for Workgroups network operating environment.

The system comprises the company's JetFax II facsimile machine and JetFax/Windows 2.0 software. It enables Windows for Workgroups users to compose faxes by combining text, graphics, illustrations and spreadsheet data from various Windows applications.

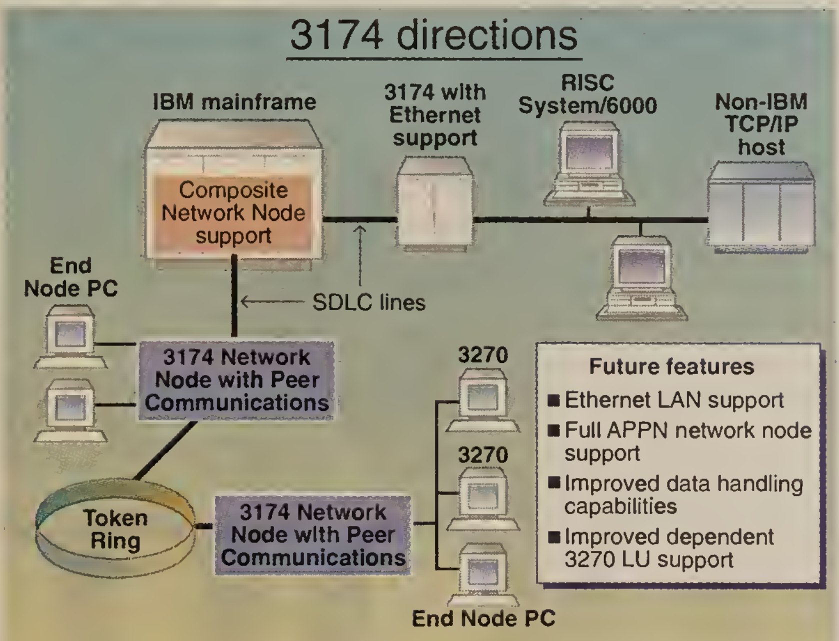
The system is priced at $795 and will be available later this month.

IMRS, Inc. of Stamford, Conn., recently said it will port the version of its Hyperion network-based business reporting application it is developing for Windows NT to Digital Equipment Corp.'s 64-bit Reduced Instruction Set Computing Alpha AXP platform. Hyperion currently runs under Microsoft Corp.'s Windows 3.1.

Porting Hyperion to Alpha AXP will provide IMRS customers with the option of moving their corporate reporting functions to a higher performance computer.

Hyperion collects data from multiple general ledger and planning systems and creates an enterprisewide financial and business information database.

This collected data can then be used by executives, managers and analysts for budgeting, forecasting, planning and analysis. ◻


3174 directions
IBM mainframe
Composite Network Node support
3174 with Ethernet support
RISC System/6000
Non-IBM TCP/IP host
End Node PC
SDLC lines
3174 Network Node with Peer Communications
Token Ring
3174 Network Node with Peer Communications
3270
3270
End Node PC
Future features
■ Ethernet LAN support
■ Full APPN network node support
■ Improved data handling capabilities
■ Improved dependent 3270 LU support

Currently positioned as an ASCII or 3270 concentrator, IBM's 3174 Establishment Controller will grow to support Advanced Peer-to-Peer Networking (APPN) technology and Ethernet LANs.

GRAPHIC BY SUSAN SLATER

SOURCE: IBM, WHITE PLAINS, N.Y.

IBM spells out future role of APPN in 3174 controller

Vendor attempts to expand user view of product.

By Michael Cooney
Senior Editor

WHITE PLAINS, N.Y. — Faced with dwindling sales and tough competition, IBM 3174 Establishment Controller planners are determined not to let the stalwart controller become lost in networking backwater.

IBM 3174 planners say in the future they will battle the competition with Advanced Peer-to-Peer Networking (APPN) and improved multivendor local-area network support ("Controller vendors fall victim to LANs," *NW,* April 20). Plus, IBM intends to add these new functions for attached personal computers and workstations while continuing to support fixed-function 3270 terminals.

"Part of the dilemma we have is that many customers still think of the 3174 as a display controller, but because of its adaptable operating code, it really can do much more," said Ed Linde, IBM product administrator for the 3174.

The 3174 is one of the few IBM platforms that supports the firm's ballyhooed APPN Network Node technology. Network Nodes are the brains of IBM's APPN, a scheme for routing Systems Network Architecture data without host intervention. Network Nodes keep directories and routing tables for resources in the net.

Today, a 3174 Network Node can only communicate with another 3174 Network Node over a Token-Ring LAN. Or, with 3174 Peer software, PCs linked to the 3174 by coaxial cable can communicate with one another over Token Rings without involving the mainframe.

The 3174 will be eventually upgraded to participate in full-function APPN nets that include IBM mainframes. Once it is a full-function APPN Network Node, the 3174 will be able to dynamically pick the best route for SNA data to flow, as well as control pacing and prioritization of traffic.

One of the biggest concerns users face is how their existing 3270 terminals and controllers will be brought into the emerging APPN world. Linde said 3174 microcode will be upgraded to let existing 3270 data traverse the wide-area APPN net via a new feature known as logical unit server/requester support. The logical user requester feature will reside in the 3174 and encapsulate 3270 data in LU 6.2 sessions for routing over the APPN net to the logical unit server function residing in VTAM. The LU server unwraps the 3270 data and passes it on to its destination.

"Ultimately, customers will be able to have AS/400s, PS/2s and RS/6000s share the same network as their 3270s," said Bill Henthorn, IBM's 3174 APPN product administrator. "Users will be able to support both their old environments and their new as they move forward."

(continued on page 17)

AT&T allies look beyond Integrator

Venture partners are checking out alternatives in event Accumaster Integrator goes by wayside.

By Jim Duffy
Senior Editor

BRIDGEWATER, N.J. — AT&T's network management business partners are mulling alternative activities with the carrier, from realigning to terminating relationships, should AT&T's Accumaster Integrator be pulled from the market.

IBM, Systems Center, Inc. and Unisys Corp. have joint development, marketing and resale arrangements with AT&T centered around the Integrator, which debuted almost four years ago as an umbrella "manager of managers" for enterprise voice and data networks.

AT&T is now considering pulling the management system off the market due to lagging sales ("AT&T weighs alternatives to Accumaster Integrator," *NW,* Nov. 23). Should that happen, AT&T's management partners believe their business with the carrier will be focused elsewhere or cease altogether.

"AT&T's going to have to decide what their product offerings and platforms will be," said Dan Walters, IBM product manager for network management carrier services. "Where it makes sense, particularly from a customer's requirements perspective, we'll work with them."

IBM and AT&T first entered into a joint network management development and marketing relationship last year when they announced intentions to develop software that links the Integrator with IBM's NetView. The software would allow either management system to control the other, as well as exchange alerts and configuration data.

IBM and AT&T are now engaged in marketing, installing

(continued on page 17)

Telematics makes public its ATM support strategy

By Jim Duffy
Senior Editor

WALTHAM, Mass. — Telematics International, Inc. became the latest data communications equipment vendor to espouse a strategy for supporting Asynchronous Transfer Mode (ATM) switching in its product line.

The Fort Lauderdale, Fla., maker of packet switches announced here ATM backbone, access and adaption-layer products that will be generally available in mid-1994.

The products — code-named AToM — will be targeted at network service providers and large end users and will be priced competitively with present-day time-division multiplexing gear, the company said.

The initial AToM product will be a single chassis that can be configured into a backbone, access or adaption layer switch. It will house 16 I/O slots for modules sporting V.35 and V.11 interfaces to T-1/E-1, T-3/E-3, Switched Multimegabit Data Service, 155M bit/sec Synchronous Optical Network Optical Carrier-3, frame relay, X.25 and ATM services.

The switch will support up to 64 T-1/E-1 and 16 3/E-3 links. It will have a backplane speed of 2.5G bit/sec and a throughput of 1M 53-byte cell/sec.

The AToM switch will allow carriers to create a unified view of all virtual nets, allowing them to share bandwidth as necessary.

For example, users or carriers will be able to dynamically define network links on an as-needed basis using available bandwidth from any virtual net.

"Today's virtual private nets are 98% voice, but people want videoconferencing, switched 56K bit/sec data transfer and electronic mail," said Mark Winther, an analyst at LINK Resources Corp. in New York.

Telematics did not disclose specific pricing for the AToM products. ◻

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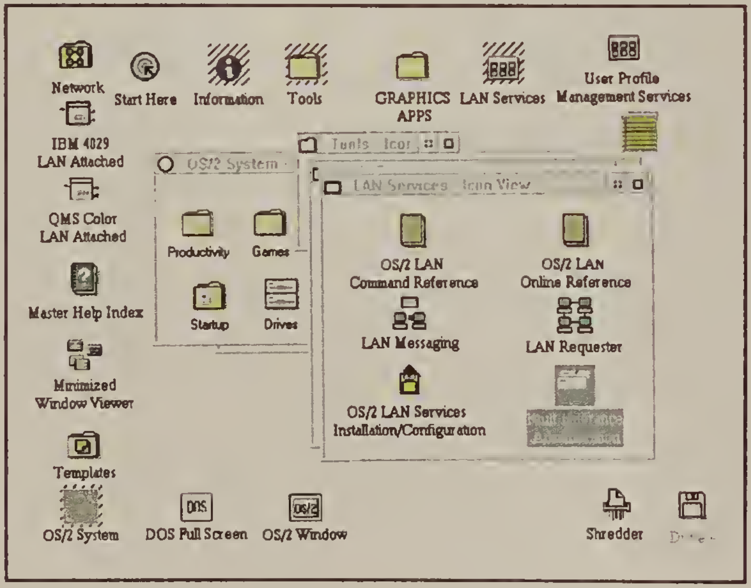

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5 ☐ Within six months
6 ☐ Within one year

3. Scope of purchase responsibility
7 ☐ Enterprise wide
8 ☐ Departmental

4. Purchase influence/number of sites
9 ☐ one site
10 ☐ 2-9 sites
11 ☐ 10-20 sites
12 ☐ 21+ sites

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11 ☐ 10-20 sites
12 ☐ 21+ sites

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10 ☐ 2-9 sites
11 ☐ 10-20 sites
12 ☐ 21+ sites

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Worth Noting

"A Novell network is the computer equivalent of a bag of Lays potato chips — nobody can install just one."

"Computer Software & Services Viewpoint"
A Bear, Stearns & Company, Inc. newsletter
New York

Netnotes

Storage Computer Corp. recently brought out what it calls a RAID Level 7 Redundant Array of Inexpensive Disks product, dubbed StorComp RAID 7.

Although the product does not have the high levels of fault-tolerant capabilities associated with higher level RAID products, such as RAID 5, the company claims it delivers unmatched on-line performance capabilities.

StorComp RAID 7 is an array of Small Computer System Interface disks that provide users from 1G to 141G bytes of on-line storage. It is a combination hardware and software product that attaches directly to the network file server.

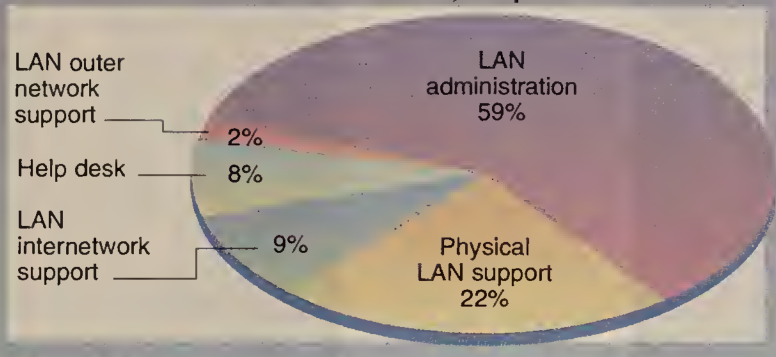
According to Storage Computer, based in Nashua, N.H., the difference between StorComp RAID 7 and other disk arrays is its hardware design.

The StorComp RAID 7 system does provide some fault tolerance in addition to the higher performance. It uses an on-line spare disk to ensure that if one disk fails, data is not lost. It also provides hot-swappable capabilities so the administrator does not have to take the system down to change a disk.

StorComp RAID 7 is available now starting at $15,900 for a desktop unit and at $19,500 for an integrated rack-mounted unit.

The high cost of LAN support

Allocation of annual $1,270 per user



The typical support cost for a 5,000-user LAN internetwork is $6.4 million a year, according to Forrester Research, which boils down to about $1,270 per user per year. By contrast, the annual cost of maintaining a similarly sized IBM SNA network is about $2.3 million.

GRAPHIC BY TERRI MITCHELL

SOURCE: FORRESTER RESEARCH, INC., CAMBRIDGE, MASS.

Novell to release digital signature NLM for NetWare

Prompted by recently discovered security threats.

By Caryn Gillooly
Senior Editor

PROVO, Utah — Novell, Inc., long criticized for security holes in NetWare, has added support for digital signature capabilities to the local-area network operating system.

The move comes in response to a program written by a student from a university in the Netherlands that lets unauthorized users assume the security rights of other users ("Plugging the leak," Briefs, *NW*, Nov. 23).

> The code assures the server that the user is indeed who the person claims to be.
>
> ▲▲▲

The program even made it possible, for example, for users to assume the security rights of network supervisors.

"We were first made aware of the threat about a month and a half ago, and as we started to investigate the issue, we found weaknesses in [IPX]," said Jan Newman, executive vice-president of Novell's NetWare Systems Group. "The protocol basically lets people gain information and forge [unauthorized] connections."

Novell said it solved the problem by coming up with a way to associate each end user with a digital signature — basically code tacked onto the end of a packet that contains information about who sent the packet, similar to a written signature on a letter. The code assures the server that the user is indeed who the person claims to be and then grants access rights as spelled out in the NetWare bindery, where all information about access rights is kept.

The digital signature capabilities were released in the form of a NetWare Loadable Module (NLM), a new client shell and a set of utilities.

The eight bytes of signature informaton associated with the end user is appended to the end of the sender's packet by the new client shell and is recognized by the NLM.

According to Newman, administrators will be able to set variable security parameters with the NLM. For example, it will be possible to set the server to accept only those packets with digital signatures or those with both signed and unsigned packets.

Newman said that because the packet itself does not change — the size of the data field and the header information remains the same — both new and existing client shells will be able to coexist in the same LAN. However, because of the added signature, Newman did concede that some users may have to take a performance hit.

"The performance [loss] in small to midsize nets will be neg-

(continued on page 16)

Syntax rollouts key on TotalNet mgmt.

Products support TotalNet management from DOS stations, provide Unix/NetWare integration.

By Maureen Molloy
Senior Writer

FEDERAL WAY, Wash. — Syntax, Inc. will release over the next two months four software products that beef up the management and file-sharing capabilities of its TotalNet LAN network operating system.

The vendor also announced it has signed a reseller agreement with Novell, Inc. to distribute that firm's LAN WorkPlace for DOS Version 4.1 with Syntax's new TotalNet for DOS network operating system. LAN WorkPlace for DOS uses the Transmission Control Protocol/Internet Protocol to give DOS and Windows users access to Unix and NetWare-based resources, enabling them to share files and access printers and databases.

Software lineup

The first of the four new software programs is called TotalAdmin, a network administration software package that will be released in December. It lets a network administrator manage devices running the TotalNet network operating system from a single DOS workstation and allows a group of servers to be managed as a single unit.

Those capabilities let administrators change user identifications and passwords, for instance, on multiple servers simultaneously rather than make the changes separately.

TotalAdmin will be bundled

(continued on page 16)

Firm offers antivirus and recovery pack for NetWare

By Caryn Gillooly
Senior Editor

BATON ROUGE, La. — Fifth Generation Systems, Inc. last week brought out an antivirus product specifically designed for Novell, Inc. NetWare 3.X LANs.

Called the Untouchable Network NLM, the software is a NetWare Loadable Module that provides virus protection and data recovery from known as well as unknown viruses on NetWare servers.

Untouchable Network NLM works by performing integrity checks on files within the file server. With that process, the software ensures that the file stored one day is identical to the one being accessed the following day. Thus, it can detect viruses, which add code to or alter the existing code of the executable file of a particular application.

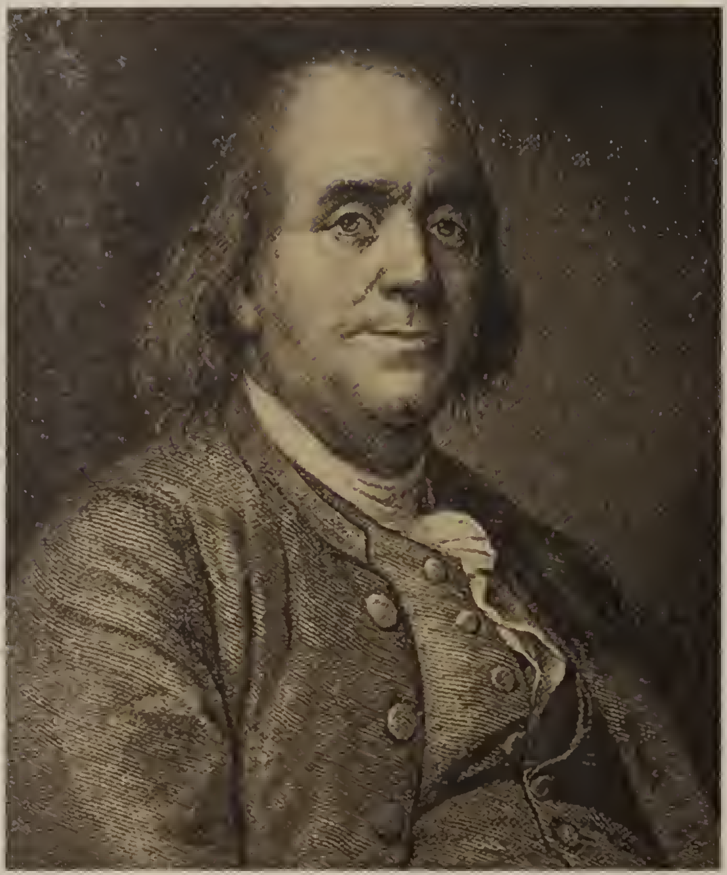
Integrity checking is also an effective way to guard against unknown viruses. Many companies release scannning products, for example, that look for specific viruses. However, these must be updated frequently as new viruses are discovered. Also, integrity checking eliminates the need for frequent software updates.

Other abilities

In addition to checking all active files, Untouchable Network NLM performs on-line scanning of compressed and archived files. The product also works with Fifth Generation's existing Untouchable Network product for workstation-based virus protection.

According to Fifth Generation, based here, the workstation product not only performs integrity checks on all workstation-resident files, but it also lets administrators install and operate the product from a central location. Additionally, it provides ongoing status reports of each workstation that can be compiled into an overall network report.

Untouchable Network NLM will be available by the end of the year for $995 per server. A bundle of Untouchable Network NLM for the server and the Untouchable Network 10-node starter kit for the network clients will be available for $1,295, a savings of almost $400 when the products are purchased separately.



"Electrifying idea, my boy."
Benjamin Franklin

"Thou art a superb writer."
Shakespeare

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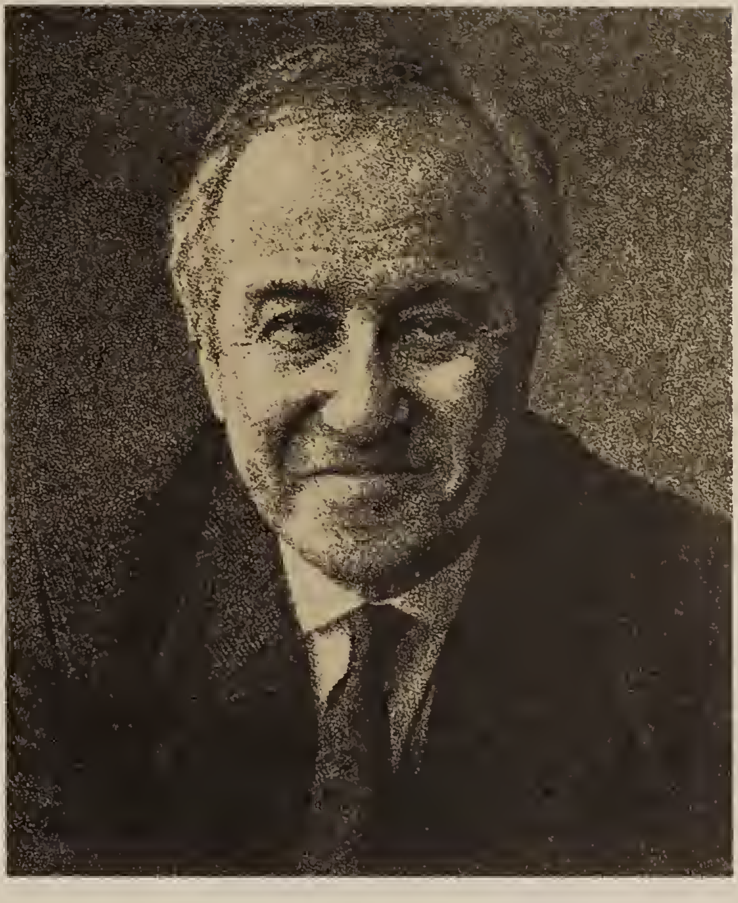
*Readers responded to the question in Network World's Enterprise Technology survey: "Please vote for the one vendor whose products or services you feel are most interoperable, or are best designed to work in an enterprise network environment."

"Music to my ears."
Wolfgang Amadeus Mozart



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The right choice.

Syntax rollouts key on TotalNet

continued from page 13

with Syntax's LMserver software for Unix that provides file, terminal-emulation and distributed processing services to DOS, OS/2 and Unix workstations. LMserver has an administration utility to manage a local LMserver host. With the two products, the net administrator can now manage every LMserver host on the network.

The TotalAdmin software comes equipped with a menu-driven interface and on-line help features. It obviates the need for administrators to be familiar with Unix operating system commands, and it lets them perform a spate of functions from any workstation. Administrators can add or delete user accounts and services offered on a server, add or delete a server as a group member, change passwords, limit user access and send a message to any client.

TotalAdmin will be available with Version 4.0 of LMserver.

The company's second new product, called NWserver, is server software that lets Unix computers provide file-and-print services to Ethernet-attached NetWare clients. A NetWare user can link to an NWserver host in the same way it does to a NetWare server because the NWserver host appears to the client as a NetWare server.

NWserver acts as an integration tool to enable a Sun Microsystems, Inc. SPARCstation, for instance, to access both a Unix and a Novell server. NWserver files are protected by NetWare and Unix security features.

NetWare users can extend their local file system by utilizing the storage space available on Unix devices, while printers formerly restricted to a Unix net can now be shared on a broader scale.

NWserver will be available in January for SunOS and IBM AIX 3.1 for the IBM RISC System/6000. Syntax said it will add support for other platforms in a future release.

The third software program, called TotalBackup, will enable net administrators to back up any number of client DOS personal computers from a central Syntax LMserver host. Equipped with a menu-driven interface, the software lets users specify that an entire hard drive be backed up or limit backup selections to particular directories and files.

Additionally, TotalBackup restores archived files to the PC from the LMserver in the event that the file is erroneously lost and shows the net administrator the label on the backup volume. This process acts as an alternative to hardware-based tape backup devices usually attached to a network.

In a typical application, PC users start TotalBackup before leaving the office for the day by specifying file selection and other criteria. The net administrator then completes the process from the LMserver host by backing up each client to common or separate archive tapes or disks.

TotalBackup will be available in December.

TotalMac pack

The final new Syntax package, called TotalMac, is server software that will enable Unix devices to act as AppleTalk servers in order to provide file and print services to Ethernet-attached Macintoshes. When used with Syntax's LMserver or NWserver, it allows files and applications to be shared between DOS, OS/2, Unix or Macintosh clients.

Users on Macintosh workstations can store applications and files on the TotalMac server for added storage space and printing options. At the same time, the file extension is transparent to the user because the Macintosh graphical user interface is retained.

Print jobs are spooled to printers attached to the TotalMac server, and PostScript printers formerly restricted to an AppleTalk net can now be shared on a broader scale.

The first release of TotalMac will be available in December for Silicon Graphics, Sun and IBM systems. Syntax said it will add support for other platforms in a future release.

Syntax also signed an agreement with Novell to distribute the vendor's LAN WorkPlace for DOS Version 4.1 with Syntax's TotalNet for DOS.

Packaged together, the two products provide users of Syntax's TCP/IP offering, called File Transfer Protocol (FTP) PC/TCP, with a migration path from FTP to the more advanced LAN WorkPlace for DOS.

The upgrade will cost between $30 and $75, depending on the site license.

Novell to release digital signature

continued from page 13

ligible," he said. "But as you get into larger systems with 250 machines or more, users will see about a 10% degradation."

According to Newman, the digital signature capability is only the first step toward making NetWare a more secure environment. Within the next few weeks, Novell plans to release a value-added process version of the digital signature capability, adding security to NetWare 2.X environments.

During the first half of next year, Novell plans to release an encryption NLM for NetWare 3.11 environments that will let users transmit information across the network in encrypted form.

Although Newman said the digital signature capabilities will be standard in NetWare 4.0 — which is expected to be released in the first quarter of next year — the encryption capabilities will be an add-on service to the new NetWare version.

The NetWare 3.11 security enhancement is available now at no charge through NetWare resellers, on NetWire and NetWare Express, or by calling (800) 638-9273.

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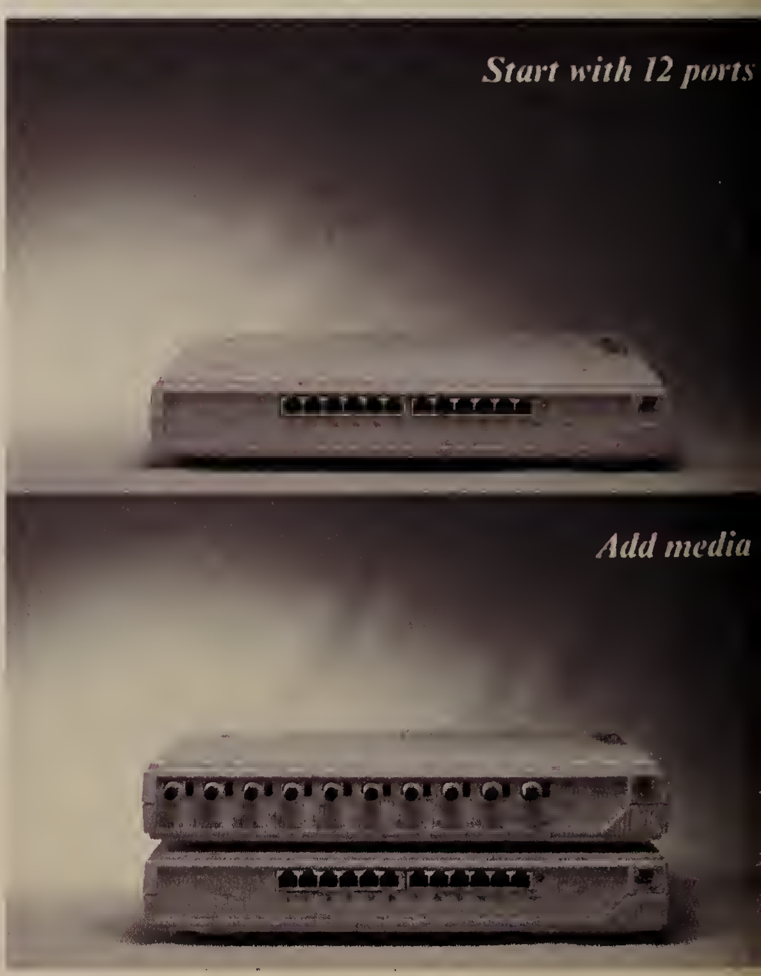

Allies look past Integrator

continued from page 9

and supporting the software in joint NetView and Integrator accounts, Walters said. Although these and other cooperative IBM/AT&T network management ventures are likely to continue, IBM now has to wait for AT&T to decide if the Integrator is its strategic management platform going forward.

If it is not, a change in management platforms "may have us change [management] communications protocols at some point in time, depending on what they settle on as a strategy and the way they position their products in the marketplace," Walters said. "We'll need to make sure that we can continue to provide cooperative management services."

Systems Center is another AT&T business partner waiting to find out where the carrier is heading in the network management arena. Systems Center and AT&T kicked off their joint network management activity almost four years ago by unveiling an application that allows Systems Center's Net/Master to send Systems Network Architecture alarm and configuration data to the Integrator.

System Center's Dale Vecchio, director of Net/Master product marketing, said AT&T's acquisition of NCR Corp. offers greater opportunity for joint activity.

"Whether we will continue to enhance our products relative to the Accumaster Integrator remains to be seen," he said. "I'd like to think we would expand that [work] into [NCR's] StarSentry and some of the other things that [AT&T does]."

StarSentry is NCR's Simple Network Management Protocol-based network and systems management product. AT&T said it is considering offering StarSentry to end users as an alternative to the Integrator.

Vecchio said Systems Center and AT&T's NCR subsidiary are already engaged in discussions about joint development on the StarSentry and Net/Master platforms, although he would not elaborate.

Likewise, IBM's Walters said his company has briefed AT&T on how IBM's AIX SystemView NetView/6000 can be used in a carrier environment. The IBM product is an SNMP-based management system that includes technology from Hewlett-Packard Co.'s OpenView management platform. According to HP, AT&T is also considering an OpenView-based system as an end-user alternative to the Integrator.

Walters would not comment when asked if AT&T expressed interest in reselling NetView/6000.

One business relationship that is likely to end if the Integrator is pulled from the market will be Unisys' resale arrangement with AT&T. Unisys started reselling the Integrator in the U.S. three years ago as an umbrella manager for its various computer and communications products.

But the Integrator met with a chilly reception in the market, said Ron Carlson, Unisys director of network management product marketing.

"The Integrator, we found, wasn't a good match between what our customers needed and what [it] offered," Carlson said.

Carlson would not say how many Integrators Unisys sold, if any. He did say, however, that Unisys will look to add some Integrator functionality to its homespun management system — the Common Network Management System (CNMS) — should AT&T pull the Integrator off the market.

Unisys unveiled CNMS two years after it signed on to resell the Integrator. ◘

IBM spells out role of 3174

continued from page 9

With the move to APPN, 3174 net management functions will also change. The 3174 now sends net management data to the host-based NetView via a System Services Control Point (SSCP)-to-physical unit management session. But SSCP-to-physical unit sessions will not exist in APPN nets, so the 3174 microcode will be upgraded to transport management data over LU 6.2.

While support for 3270 devices and enhanced management features are prime user concerns, the biggest single requirement IBM is seeing is the ability to hook existing 3174s to Ethernet LANs, Linde said.

While IBM has issued only a statement of direction for 3174 Ethernet support, analysts expect the firm to deliver a 3174 Ethernet adapter in late 1993.

IBM will provide both an Ethernet field upgrade and new 3174s with Ethernet support, Henthorn said. Such support is key for the 3174 because IBM's major competitors such as McData Corp. already support Ethernet in their 3174-compatible offerings, analysts said.

Increased support of Ethernet goes hand-in-hand with pumped up Transmission Control Protocol/Internet Protocol support. The 3174 already supports TCP/IP Telnet sessions via 3174 TCP/IP Telnet Licensed Internal Code, available now as Request Price Quotation 8Q0935. It lets 3270 and ASCII terminals linked to the 3174 establish Telnet sessions to multiple IBM or non-IBM TCP/IP host applications.

The Telnet support will be enhanced to include tn3270 support, Linde said, which gives 3270 terminals full-screen access to TCP/IP applications, whereas Telnet offers only a line-by-line picture of data.

"That's important because a large number of IBM customers are starting to build wide-area Ethernet [internets] and users need to access multiple application platforms," Linde said.

He said IBM is also looking at letting users access Ethernet and Token-Ring LANs through the same 3174. Adding frame relay support to the 3174 is another possible future enhancement.

"We think there is a probability that frame relay is something that the 3174 should support since the 3745 is going to support it," Linde said. ◘

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INTERNETWORKS

LAN-TO-LAN AND LAN-TO-WAN EQUIPMENT AND STRATEGIES

Worth Noting

"Like all new technologies, the strengths, shortcomings and side effects of ATM are untested and unknown. Just as it was with frame relay, only after deployment will we understand what [ATM is] really capable of doing and what its shortcomings are."

John Morgridge
President
Cisco Systems, Inc.
Menlo Park, Calif.

Link Notes

As expected, **Advanced Computer Communications (ACC)** last week announced that it had signed an agreement to acquire **Ring Access, Inc.**, a Systems Network Architecture internetworking vendor in San Carlos, Calif.

Under terms of the deal, Ring Access will be merged into ACC, a bridge/router and hub vendor in Cupertino, Calif. The two companies will leverage their technologies to integrate support for SNA into local-area network internets.

Proteon, Inc. is sponsoring a series of educational forums, dubbed The Internetworking Exchange, that are designed to help companies link their worldwide information processing resources.

The program will help chief information officers, information systems (IS) executives, telecommunications managers and network managers better understand the business implications of connect-

(continued on page 25)

ATM Forum vendors team to test spec for ATM nets

Four firms push standard for LAN analyzer gear.

By Skip MacAskill
Staff Writer

The ATM Forum next month will begin developing a specification defining a common way to test Asynchronous Transfer Mode equipment that ensures that test devices can be used with any vendors' ATM switches.

Four members of the forum — ATM switch rivals Adaptive Corp. and Fore Systems, Inc. along with LAN test equipment competitors Hewlett-Packard Co. and Network General Corp. — are leading the effort, which will include the development of an ATM Management Information Base (MIB) and a multicasting signaling protocol.

Exhibiting the interoperability theme that has pervaded the work of the ATM Forum, companies that are usually rivals have teamed on a single project.

"To arrive at an ATM testing specification, it has to be a cooperative environment between switching equipment vendors and test equipment vendors," said Dragos Ruiu, broadband technology manager of HP's Idacom Telecommunications division in Edmonton, Alberta, and one of the technicians who will be authoring the specification.

"We're interested in specifying an interface that all switch vendors can incorporate into their boxes and all test vendors can work to," Ruiu said. "This way, we won't have to build 10 different interfaces for 10 different switches."

As ATM networks moved out of the research labs and into real-world environments, it became necessary to upgrade the few ATM testing products that are currently available so operational testing could be done. HP is one of the few companies that is shipping ATM test equipment now.

"The test equipment we have on the market now is primarily for people who were building prototype switches and just needed to look at the physical layer aspects, such as whether the transceivers were working properly," he said. "We're now moving into real-world ATM networks, so we're going to have to test the software, the adaptation layers on top of that and actually trou-

(continued on page 25)

Cameo enhances UltraHub line, outlines ATM plans

By Maureen Molloy
Senior Writer

NASHUA, N.H. — Cameo Communications, Inc. recently announced it will enhance its UltraHub 5000 intelligent hub by adding support for token-ring and FDDI local-area networks, as well as by adding a new bridging module and an interface for Asynchronous Transfer Mode (ATM) LANs.

The vendor said it will deliver by the second quarter of next year a new backplane for the 12-slot UltraHub 5000, which currently supports four Ethernet buses. The upgrade will add support for two token-ring and two Fiber Distributed Data Interface buses.

Cameo said it will also unveil at the same time modules that will bridge the buses.

In addition to support for multiple LANs, the company will release by early next year a two-port remote Ethernet bridge module for the UltraHub 5000 that has a packet forwarding rate of 12,000 packet/sec and a packet filtering rate of 28,000 packet/sec.

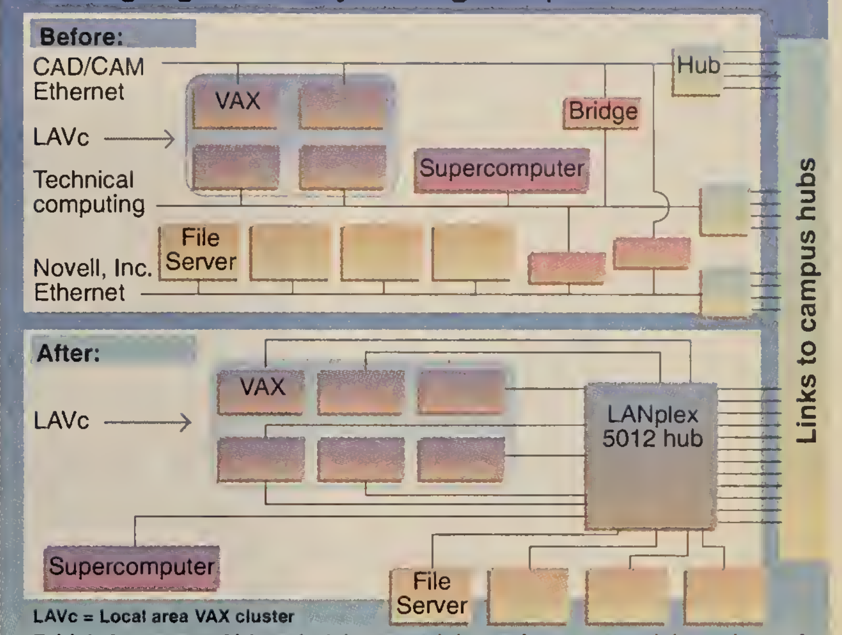
The bridge will come equipped with AUI, BNC, RJ-45 and Fiber Optic Inter-Repeater Link (FOIRL) connectors. On the wide-area network, the bridge will support frame relay at speeds up to T-1.

Module on deck

Cameo also announced it will begin shipping by early next year a four-port FOIRL module that will enable the hub to support fiber-optic cable in addition to the 10Base-T and coaxial cable it currently supports.

(continued on page 25)

Winging the way to higher performance



LAVc = Local area VAX cluster

British Aerospace Airbus, Ltd. increased the performance and throughput of its 3 Ethernet LANs by taking advantage of the switching architecture in Synernetics' LANplex 5012 hub, which provides Ethernet switching across an FDDI backplane.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: SYNERNETICS, INC., BILLERICA, MASS.

Friendlier skies with Ethernet switching

Aircraft designer installs Ethernet switching hub to increase performance, life of computing LANs.

By Skip MacAskill
Staff Writer

BRISTOL, England — Saddled with multiple unreliable, sluggish Ethernets that were bursting at the seams even after segmentation, British Aerospace Airbus, Ltd. turned to Ethernet switching technology to solve its problems.

Replacing three central hubs at its data center with a LANplex 5012 switching hub from Synernetics, Inc. enabled the company to improve performance and add new equipment without causing the network to crash.

The problem that led to the installation of the 5012 stemmed from the addition of more and more nontechnical users to the airplane manufacturer's two Ethernet local-area networks. Those nets support more than 2,000 users.

One of the nets, a computer-aided design and manufacturing net, was used by engineers to support a drafting and design application. The second was a technical computing network that supported a Convex Computer Corp. supercomputer and was used by engineers for nondrawing applications.

The two networks were also linked to a local-area VAX cluster (LAVc) at the data center that comprised four Digital Equipment Corp. VAXes: the 8700, 6420, 6210 and 3400.

The two data center LANs were extended across the campus using Fiber Optic Inter-Repeater Link (FOIRL) controller hubs to support fiber links to work group 10Base-T Ethernet hubs. Users on one LAN could access resources on the other by using bridges in the data center.

> British Aerospace faced nets that were unreliable, sluggish and bursting at the seams.
>
> ▲▲▲

Although this configuration was adequate, the company began to add a growing number of nontechnical personal computer users to both nets, adversely affecting the performance.

So British Aerospace added a third Ethernet in August 1991 to fence off the PC users into a Novell, Inc. NetWare environment anchored by four Novell file servers in the data center. This net-

(continued on page 24)

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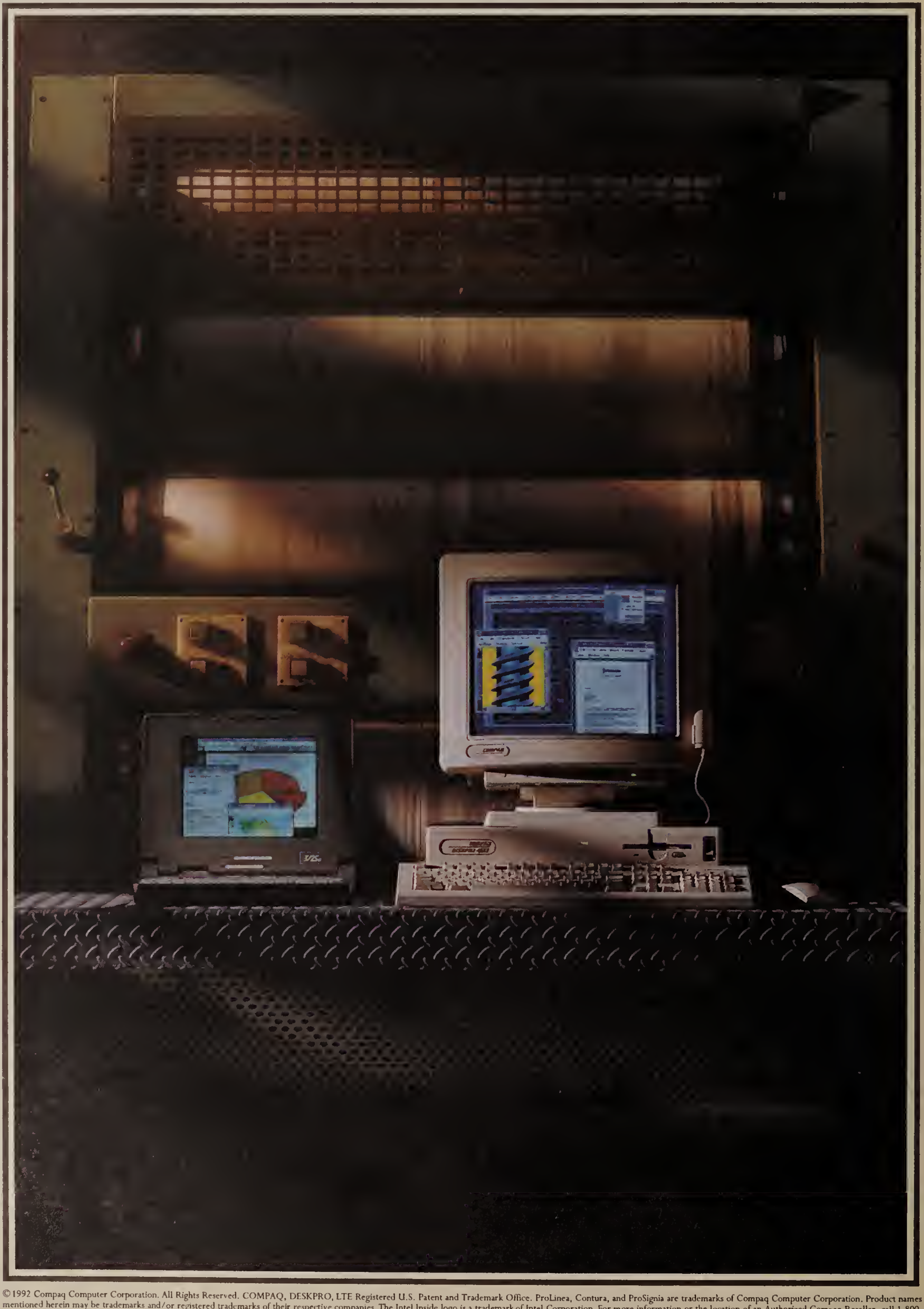

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–PC Week, October 5, 1992

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–PC Week, October 5, 1992

"...For running Windows on the road, the Compaq LTE Lite/25c is clearly the best notebook yet."
–PC Laptop, October 1992

"It is the best-looking color screen on any notebook, plain and simple."
–PC Computing, August 1992

"DeskPro/i...combines the traditional Compaq virtues of strong performance and technical innovation with aggressive pricing."
–PC Week, June 22, 1992

"Make no mistake about it: this is a strikingly energetic Compaq."
–PC Week, June 22, 1992

"You'd expect technical leadership from Compaq, but the Lite/25c's aggressive price took us completely by surprise."
–PC Computing, August 1992

"Low-cost ProLinea offers solid quality."
–InfoWorld, October 5, 1992

"...Compaq Contura 3/25 notebook is part of Compaq's clone-beater strategy and packs an aggressive price/performance punch..."
–PC Magazine, August 1992

"That's leadership."
–PC Week, June 22, 1992

intel inside

Our alliance with Intel enables us to improve on processor technologies with such advances as easy-to-upgrade architectures and sophisticated power-conservation features.

Compaq engineers have already been improving our new affordable PCs. In fact, the COMPAQ Contura PC is now available with a super-crisp, passive-matrix VGA color screen.

COMPAQ

Circle Reader Service #44

Friendlier skies with Ethernet switching

continued from page 21

work was also outfitted with a FOIRL controller supporting remote work groups and bridged to the other two nets.

Despite the addition of the Novell net, performance soon began to degrade on all three LANs due to increasing demands. The company reached a crisis point when the CAD/CAM application had to be expanded, said Graham Goodwin, manager of network services at the data center.

"We added two new DEC VAX 9000s to the LAVc, which required the purchase of new DEC 700 terminal servers," he said. "The polling frequency had to be increased to match previous performance, so the amount of traffic actually increased by a factor of four."

Thirty DEC VAXstations were added to the network, as well, and the networks soon became overloaded. Response times slowed to a crawl, sometimes taking as long as two minutes. The net was so saturated that the LAVc began to reinitialize five to six times a day, causing users to lose sessions and data.

> "The LANplex has dealt competently with the amount of bandwidth we've had to employ. Response times are crisp, and new equipment is being added without any hit."
>
> ▲▲▲

In order to deal with the immediate problem, the disparate network planning groups were brought together as one unit to better control management and inventory, the VAXstations were shelved until adequate servers could be purchased, and there was a temporary ban on the addition of new equipment.

The company also repositioned network resources and work groups so that engineers working on the same project were closer together, reducing the number of network hops a user would have to traverse to access applications. And it cleaned up the network by tracing and fixing problems resulting from faulty equipment, cabling and connectors. This resulted in better than 99% error-free operation, but the larger problem remained unsolved.

"The network was finally stable, but response was still sluggish and utilization was measured at a 60% average and 80% at its peak," Goodwin said. "The bottom line was that the addition of any new equipment would break the LAN."

The company found an answer to those problems in the LANplex 5012 Ethernet switching hub. The hub enabled the company to replace the three separate FOIRL control hubs at the data center and the bridges used to hop between the LANs by providing a central switching device between end users and target net resources.

The 5012 is a 12-slot device that has three 100M bit/sec FDDI backplane buses and supports both Ethernet and Fiber Distributed Data Interface LANs. The hub can be equipped with FDDI Concentrator Modules and Ethernet Express Modules.

Each eight-port Ethernet Express module contains its own switching engine and can support high-speed links between any Ethernet segment or pass the traffic off across one of the three FDDI backplanes to another segment or processor.

Each of British Aerospace's data center systems is given its own dedicated port on the hub, including the Convex supercomputer, the four Novell file servers and the six VAXes.

Net performance increased because the hub could switch the user directly to the needed resource. Instead of requiring a user, for example, to come into the CAD/CAM hub and be bridged across to the Novell net to access a file server, the LANplex could switch the user directly to a dedicated port supporting the desired file server.

The overall effect on British Aerospace's network operations was remarkable, according to Goodwin. "The LANplex has dealt very competently with the amount of bandwidth we've had to employ," he said. "The LAVc never reinitializes, response times are crisp, and new equipment is being added without any performance hit."

Long term, the company will take advantage of LANplex's FDDI capabilities and place two other 5012 hubs in two buildings on campus, effectively creating two regional data centers. The three hubs will then be linked in an FDDI backbone configuration, and Ethernet links to select work groups running bandwidth-intensive applications will be replaced with FDDI connections.

Vendors team to test spec for ATM nets

continued from page 21

bleshoot the nets."

The proposed specification will consist of three parts, the first of which will be the development of a common hardware interface for the switch and test device. The goal is to configure existing user interfaces on the switch to accommodate a test device.

"Because you can't tap into the bus or switching fabric of an ATM switch, the idea is to utilize the existing user interfaces on the [switches] themselves," said Mark Juliano, director of product marketing at Fore Systems. "By tweaking the existing ports, we avoid the cost and time delay of developing separate testing ports."

Since the tester's job is to look at network traffic flow and analyze it, the second part of the specification addresses how to tap into the network.

"In the switched network, there's no one place you can tap to see all the data, so the piece of test equipment has to cooperate with the ATM switch to get the information brought to it," explained George Marshall, director of marketing network technology at Adaptive Corp.

This can be accomplished by taking advantage of ATM's point-to-multipoint capability, which allows the switch to copy a cell from one end node and distribute it to specified group of other end nodes.

"We see minor changes needed in the switch software to accommodate [the multicasting functionality], but it's more in that no one has yet defined how a piece of test gear asks for permission to eavesdrop," Marshall said.

The final portion of the specification will involve the development of a general-purpose ATM MIB, which will address the diagnostic requirements needed by a test device. The MIB will most likely be modeled after the Remote Monitoring MIB.

"There are a number of ATM MIBs that have been developed by the switch vendors, and it's a matter of integrating them all into one," Ruiu said.

Since the vendor group has not yet met to discuss the way it will approach the complicated process of writing the specification, it was unable to provide any developmental time frames.

"First, we have to define what we want to do technically," said Jay Weil, vice-president of business development for Network General. "Then it becomes a matter of how quickly we can [agree] on how to reach that goal. None of us has anything at stake at this point. We just want to get it done as quickly as possible." ◪

Cameo enhances UltraHub line

continued from page 21

The vendor will also develop a LAN Security Card for the hub. This module will serve 12 ports and provide protection by sending scrambled packets to all nodes except the destination device. Users will be able to define secured user groups by permitting certain ports to communicate only within the group.

Pricing for the new modules was not available at press time.

While thin on specifics about the product, Cameo said it will add an ATM interface to the UltraHub 5000 by early 1994 to better satisfy users' multimedia requirements. The company said it also plans to develop an ATM switch during the next two years.

Finally, Cameo said it will integrate its Simple Network Management Protocol net management software, called UltraView, with Hewlett-Packard Co.'s OpenView network management system and Lexcel's Unix-based Lance+.

For more information, contact Cameo at (800) 438-4827. ◪

Link Notes

continued from page 21

ing both local and remote computers into a corporatewide network.

The forums will be held at the Atlanta Marriott Marquis on Dec. 2; at the New York Hilton and Towers on Dec. 4; at Adam's Mark Hotel in Houston on Dec. 8; and at the Toronto Hilton on Dec. 10.

The Internetworking Exchange is free to qualified IS executives. For details, call (800) 800-3881, Ext. 375.

3Com Corp. last week signed six new companies to its Network Systems Integrator (NSI) program. The vendors are EESCO, FOT Data Systems, Great Lakes Data & Voice Technologies, Internet Communications Corp., Southwest Network Services and WilTel Data Network Services. The NSIs will help 3Com users overcome the complexities inherent in building multiprotocol internets by providing installation and support services. ◪

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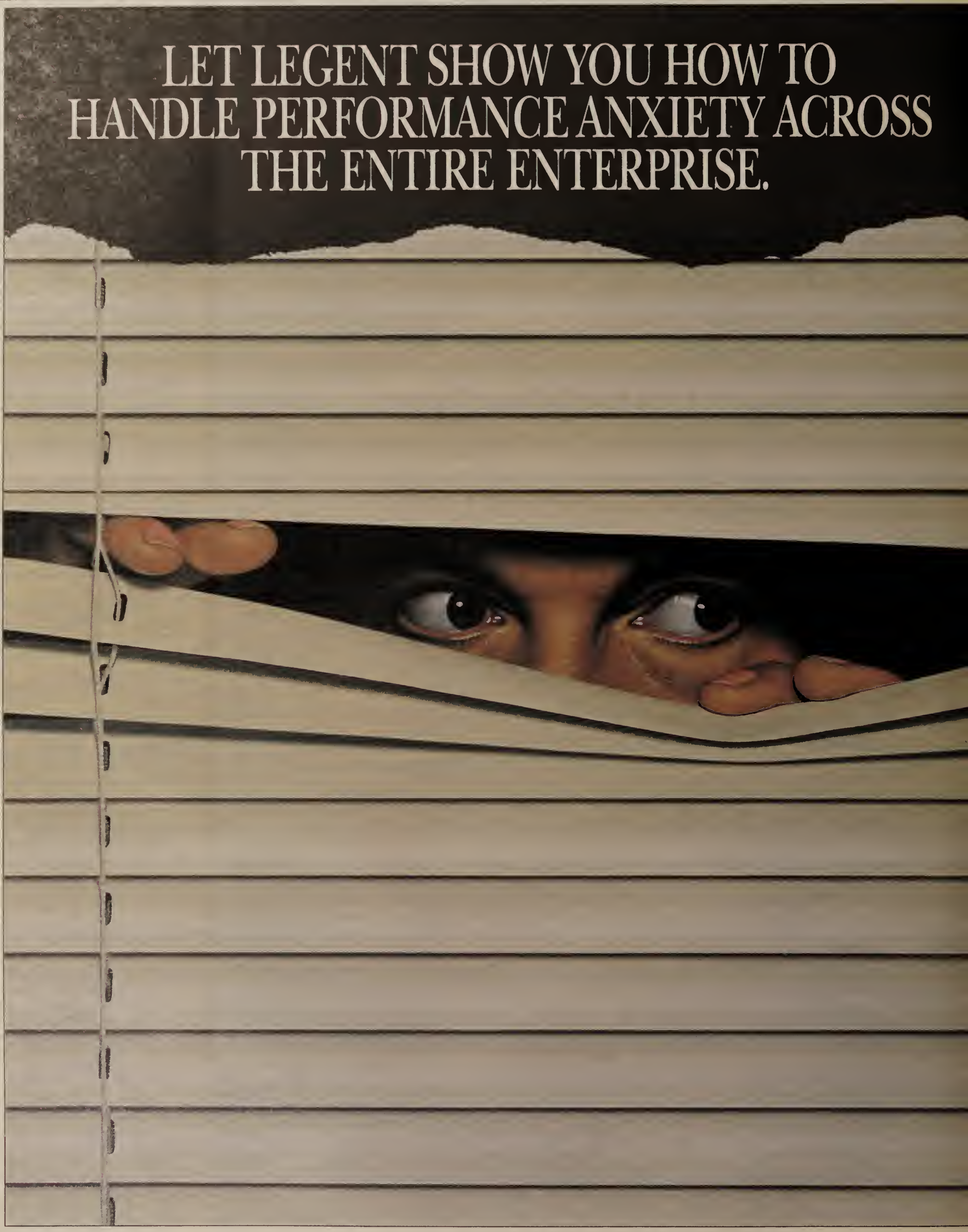

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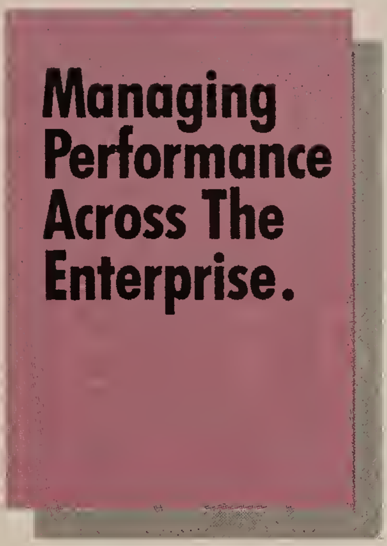

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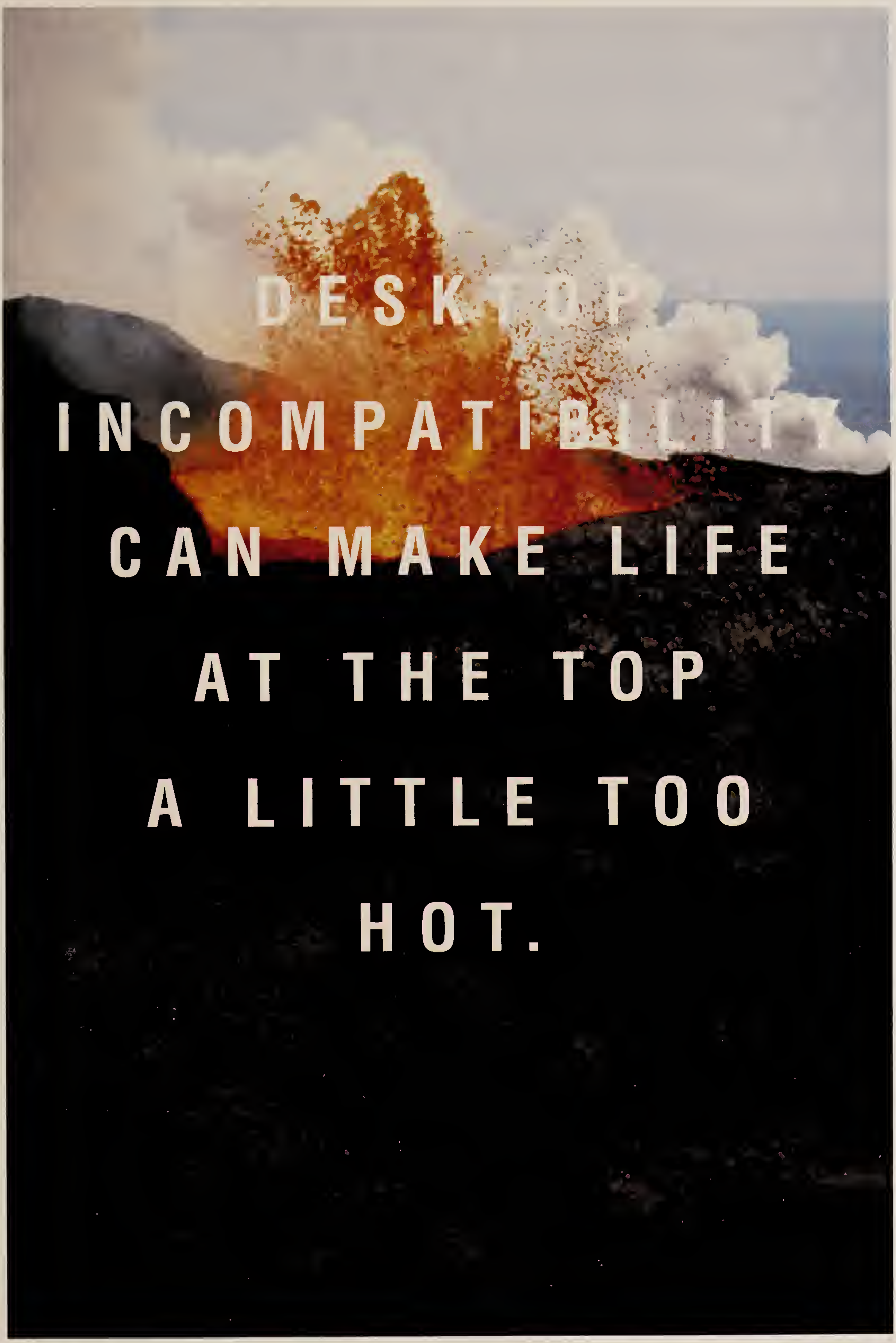
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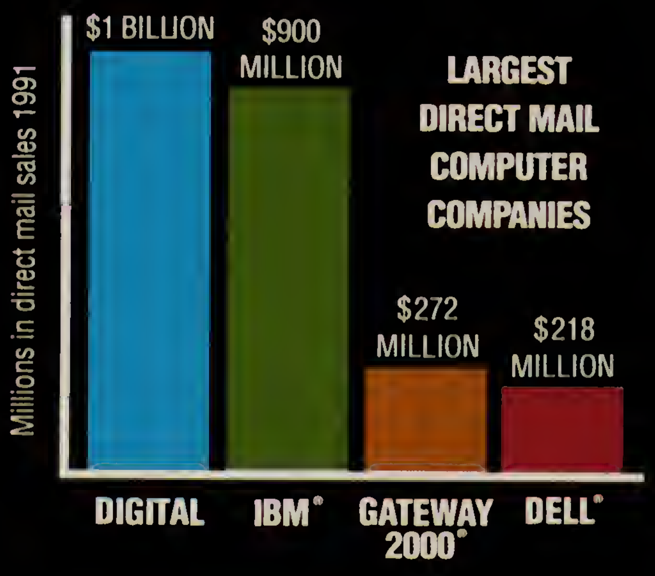
> — *USA Today*, August 7, 1992



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— **Andrew Seybold, Editor-in-Chief**
The Outlook on Professional Computing
August 24, 1992

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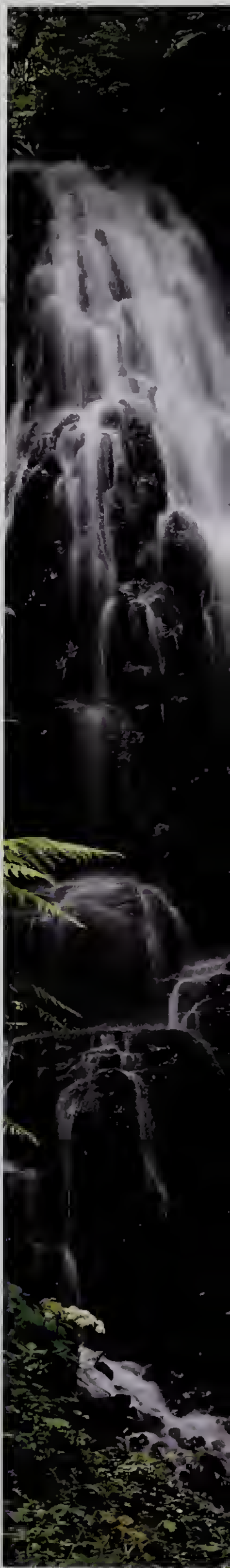
"DECPC BESTS LOW-COST 486DX FIELD. PERFORMANCE, EXPANDABILITY AND DESIGN STAND OUT... Digital Equipment Corp.'s system the overall winner in PC Week Labs tests..."

— *PC Week*, October 5, 1992



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Worth Noting

This year marks the 25th anniversary of 800 service, which AT&T began offering in 1967. Since then, new technology and marketing techniques have turned 800 service into a $7 billion industry.

Carrier Watch

Bell Atlantic Corp. is pressing the Federal Communications Commission to include alternative access providers under any new tariffing rules the agency issues.

The request was filed as a formal complaint with the FCC in the wake of a federal appeals court decision that said the agency's policy of allowing nondominant carriers, including alternative access providers, to operate without tariffs is illegal.

In its complaint, the local carrier did not single out any local access providers by name; instead, it referred to any competitor operating in its territory that is not filing tariffs.

"Bell Atlantic has sustained substantial damage in the form of lost customers, lost market position and lost profits," the carrier stated in its formal complaint.

Had the other carriers filed tariffs, they would have been unable to undercut Bell Atlantic's rates and charges without providing public notice, the company stated.

In an effort to stop rivals from continuing to operate without tariffs, Bell Atlantic asked the FCC to issue a cease and desist order. The carrier also asked for damages of $6,000 plus $300 per day for each instance in which rivals provide service to customers without a tariff.

(continued on page 30)

Pricing trans-Atlantic links

The monthly cost of a 64K bit/sec fiber-optic trans-Atlantic circuit

Country	U.S. segment	Foreign segment	Total
Belgium	$3,400	$4,452	$7,852
France	$3,400	$4,506	$7,906
Germany	$3,400	$4,529	$7,929
Netherlands	$3,400	$4,519	$7,919
U.K.	$3,400	$4,850	$8,250

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: LYNX TECHNOLOGIES, INC., LITTLE FALLS, N.J.

Ascend rolls out low-end LAN interconnect product

Multiband LSU can be used for many applications.

By Bob Wallace
Senior Editor

ALAMEDA, Calif. — Ascend Communications, Inc. has introduced the Multiband LAN Service Unit (LSU), a low-end data service unit/channel service unit (DSU/CSU) that can be upgraded to a fully equipped high-end inverse multiplexer.

The LSU was designed to familiarize net managers with local-area network interconnection equipment in the hopes that they will gradually upgrade the software with more feature-rich software packages.

The LSU can handle peak traffic generated by LAN interconnection, imaging and videoconferencing. It can also be used for disaster recovery.

LSU packs

The device can be equipped with three software packages. The first enables the device to serve as a leased-line CSU, supporting 56K bit/sec digital data services (DDS), fractional T-1, T-1, two- or four-wire switched 56K bit/sec service, Integrated Services Digital Network Basic Rate Interface and ISDN Primary Rate Interface lines.

The LSU's Dial Option Package enables the device to dial up different switched connections, including 56K, 64K, 384K and 1.536M bit/sec, but cannot combine them to form a single pipe.

The LSU uses ISDN signaling for a PRI access line and inband bit-robbed signaling with T-1 access pipes. The device employs V.25 bis or control-lead dialing.

The third version is called the Dynamic Bandwidth Allocation Package and supports such features as inverse multiplexing, Dynamic Bandwidth Allocation and Automatic Overflow Handling.

With the Dynamic Bandwidth Allocation feature, the Multiband LSU dials up only the amount of bandwidth the application needs and dynamically adds and drops channels as the user's data transmission needs change.

With Automatic Overflow Handling, the Multiband LSU's software tells the CSU when to add or reduce bandwidth for any given internetwork application.

The product's usage monitoring and capping software enables the device to send an alert to a network management system or to an Ascend net management terminal when preset switched service usage levels are exceeded. The unit also supports such features as diagnostics, statistics collection and network management.

It uses a proprietary Ascend Inverse Multiplexing (AIM) scheme but can also support an inverse multiplexing protocol developed by the Bandwidth-On-Demand Interoperability Group (BONDING), a collection of current and prospective inverse mux vendors.

When configured with the high-end software package, the Multiband LSU interoperates with other Ascend Multiband products and BONDING-compliant inverse multiplexers and DSC/CSUs for switched and dedicated digital links.

The LSU and other Ascend products have been certified for use with switched and dedicated network services in many foreign countries.

The device is available now and costs about $4,000 with the base unit software package, $6,500 with the Dial Option Package and about $8,500 with the Dynamic Bandwidth Allocation Package.

NTI unveils wireless telephone systems

Systems are ideal for users who rely on phones for their work but are often away from their desks.

By Bob Wallace
Senior Editor

RICHARDSON, Texas — Hoping to cash in on the burgeoning market for wireless switching products, Northern Telecom, Inc. (NTI) has announced a low-end wireless telephone system and a wireless switch adjunct for use with any Centrex, PBX or key system.

The switch maker's Companion 10 is a stand-alone telephone system that can support up to 32 portable telephones, while the Companion 100 adjunct system can support as many as 80 portable phones.

NTI claimed that the products are the first wireless business systems available that support the CT2 Common Air Interface (CAI) — an emerging global standard for low-power wireless telecommunications.

The firm will offer the Companions in the U.S. once the Federal Communications Commission issues licenses for the necessary frequencies, possibly by the third quarter of 1993.

The Companions are designed for organizations, such as hospitals, factories and retailers, whose employees are frequently away from their desks but rely on telephones for internal and external communications.

"The Companion introduction marks an important advance for business people wishing to improve productivity and customer service," said John Roth, wireless systems president at NTI. "Now users can make high-quality digital calls anywhere in their work environment."

Low-end system

The Companion 10 is a six-trunk, 15-extension telephone system that can support all pocket phones, a mix of pocket phones

(continued on page 30)

Teleglobe begins service on transpacific fiber link

MONTREAL — Teleglobe Canada, Inc. last week announced that it and 48 other international telecommunications carriers from 34 countries recently began offering service on Trans-Pacific Cable-4 (TPC-4), the first undersea fiber cable linking Canada and the U.S. directly to Japan.

The $381.1 million system consists of two fiber pairs, each providing capacity for 80,000 simultaneous voice conversations or any mix of voice, data and video calls. It links Chikura, Japan, with Port Alberni, B.C., and Point Arena, Calif.

Teleglobe was the first carrier to formally announce the availability of network services on the system, followed closely by AT&T, which holds the biggest stake in the cable.

Teleglobe will offer International Direct Distance Dialing, virtual private network and 64K bit/sec private-line services over the system.

Teleglobe has filed tariffs for services sold over the transpacific system and expects to begin offering them, pending approval from the Canadian Radio and Television Telecommunications Commission, the Canadian equivalent of the Federal Communications Commission.

Transpacific redundancy

TPC-4 is the first transpacific fiber-optic system to operate at 560M bit/sec, offering double the capacity of its predecessor, the HAW-4/TPC-3 system, which links the U.S. mainland, Hawaii, Guam and Japan. These systems will now be used to back each other up in the event of an outage. Teleglobe holds a 9.2% stake in TPC-4.

Teleglobe's network of transoceanic and satellite links connects businesses in Canada with more than 200 countries and territories but does not extend into the U.S.

IBM gives its plan hard sell

continued from page 2

based applications not be bound to a single net protocol, but instead be able to run any application over any transport network service. MPTN will support SNA, the Open Systems Interconnection, Transmission Control Protocol/Internet Protocol, AppleTalk, the Network Basic I/O System and Novell, Inc.'s Internetwork Packet Exchange (IPX).

According to IBM, MPTN will be implemented in its primary operating systems, such as OS/2, OS/400, VM and MVS. Applications written to the MPTN specification would then ride on top of these operating systems and be able to support clients on various types of networks.

> In the past few months, IBM has been quietly pushing hard for MPTN acceptance in standards bodies such as X/Open Company, Ltd., but it has not yet met with success.
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For example, applications written to MPTN and deployed on separate SNA- and OSI-based nets could be linked to each another via the IBM 6611 router. The router, running MPTN software, would perform the protocol translations necessary to pass data between the nets, eliminating the need for a local application-level gateway and multiple communications stacks on each of the remote nodes.

According to Thomas Routt, president of Vedacom Corp., a networking consultancy in Seattle, IBM could also use MPTN to build multiprotocol servers. For example, a single application on a server outfitted with MPTN support and SNA, OSI and TCP/IP protocol stacks could support clients on SNA, OSI and TCP/IP nets, with MPTN acting as a protocol interpreter.

Long row to hoe

The idea sounds nice on paper, but getting industry to buy into MPTN is another thing. In the past few months, IBM has been quietly pushing hard for MPTN acceptance in standards bodies such as X/Open Company, Ltd., but it has not yet met with success. The firm has also been beating the bushes for third-party support with only limited success, sources said.

Only one company, Ki Research, Inc., a Digital Equipment Corp. communications software developer in Columbia, Md., has been identified by IBM as working on MPTN-compliant software.

Ki Research is reportedly developing an MPTN-compliant management application that will be able to gather SNA, TCP/IP or OSI net management data and report it to a DECnet-based manager.

Sources indicate that at least one other software development firm is working on products that will conform to the MPTN specification. IBM declined to identify other MPTN vendors or indicate how many vendors are working to develop MPTN products.

According to IBM, products conforming to the specification are expected early next year. Sources said the first products will likely reside on the mainframe.

"The [MPTN] architecture is in good shape, and we are working with a couple of prototypes in our labs," said Diane Pozefsky, IBM's lead MPTN architect.

The MPTN-compatible implementations IBM has talked about publicly are TCP/IP Sockets applications over SNA, known as SNAckets, and Common Program Interface-Communications applications over TCP/IP ("IBM maps out SNA strategy for the '90s, *NW,* March 30).

Earlier this summer, IBM demonstrated one of those prototypes to the OSI Technical Committee, a subset of the OSI Implementors Workshop (OIW), which is now in the process of gathering requests for comment from other OSI work groups in Asia and Europe.

"The key questions for us and the other OSI work groups are whether this is the best technology to solve the multivendor interoperability problem and whether other vendors will build on it," said Jerry Johnson, the standards analyst at the department of information resources for the state of Texas and chairman of the OSI Technical Committee. "It is premature to say how MPTN will fare in the work groups, but at least IBM has now put it in the public arena for open discussion."

X/Open mulls spec

IBM has also been working with the X/Open consortium to have MPTN added to the X/Open Transport Interface (XTI) communications interface. XTI defines how OSI and TCP/IP applications can interoperate. IBM wants to add SNA extensions via MPTN to XTI, which would then be known as eXTI.

X/Open has been evaluating the eXTI specification since early this year and has given it mixed reviews. "It hasn't actually been rejected by us," said Derek Kauffman, technical vice-president for X/Open. "It has been moved from our technical forum to our strategic forum [because] the technical forum said, 'No, we don't want to do it because it's not OSI.' "

This sort of hot potato treatment is not unusual for a new proposal, Kauffman noted.

"We're hoping that the standards bodies accept it because that will make [vendors and users] feel better about using it," Pozefsky said. "There are a couple of companies still skeptical about how much work it will take to implement the specification, but once we explain the details, they'll see it's not that difficult."

She declined to say which companies were in opposition.

Another key for MPTN's success will be how IBM chooses to deliver the technology to third-party developers, a decision Pozefsky said has yet to be made.

If the standards bodies adopt MPTN, it will likely be available for free, she said. If not, IBM will make the technology available for a "reasonable" price.

Staff Writer Skip MacAskill contributed to this story.

Regulatory Update

continued from page 29

The Federal Communications Commission denied a request from **Allnet Communication Services, Inc.** to review data showing how the regional Bell holding companies calculated prices for new Open Network Architecture (ONA) services.

The carriers used a model called the Switching Cost Information System to allocate costs generated by ONA services separately from costs generated by other services using the same switches. The FCC requires the RBHCs to price ONA services on cost plus a reasonable overhead.

The RBHCs strenuously opposed Allnet's request, claiming that such a disclosure would reveal proprietary information about their networks. Last week, the FCC agreed and — instead of releasing the pricing information to Allnet — said it would conduct a private review of the data.

MCI to market Xiox toll fraud protection system

By Bob Wallace
Senior Editor

WASHINGTON, D.C. — MCI Communications Corp. has signed an aggreement with Xiox Corp. to resell the company's toll fraud prevention products to long-distance customers.

The move is designed to help MCI arm users in the escalating war against toll fraud, which analysts estimate will cost users well over $2 billion by year end.

Xiox's Fort Knox family of telecommunications security products include the Hacker Preventer, a system that combines artificial intelligence and speech recognition capabilities to thwart hackers ("Xiox wields AI in war on toll fraud," Oct. 26).

According to analysts, Hacker Preventer and other Xiox Fort Knox products are the most powerful weapons yet for combating toll fraud. They are expected to be so effective that The Travelers Corp., a Hartford, Conn., insurance provider, will offer users a 25% discount on their toll fraud insurance policies.

The Hacker Preventer uses AI to help users build calling profiles for each employee and automatically notifies the network manager when it detects calling patterns that do not match the profiles.

It can also step up security in the event of unusual activity by, for example, requiring the caller to use a verbal password.

MCI's decision to market the Xiox Hacker Preventer augments the carrier's network usage surveillance activities, under which it monitors firms' usage for spikes. However, the carrier is the only one of the Big Three that has not announced a toll fraud prevention program.

Hacker Preventer uses proprietary hardware and software and connects to the user's private branch exchange. It ranges in price from $10,000 to $28,000, depending on the size of the system needing protection.

Xiox of Burlingame, Calif., markets its products via its direct sales force, dealers, regional Bell holding company equipment sales units and OEMs.

NTI unveils wireless system

continued from page 29

and desktop extensions, or all desk phone sets.

The wireless system includes a controller, base stations that are placed throughout a building and lightweight pocket telephones. The Companion 10 can cover about 450,000 square feet. Each base station uses two radio channels, each of which can support a single telephone call.

Like the Companion 10, the Companion 100 includes a controller, base stations that are placed throughout a building and lightweight pocket telephones. The controller can be connected via digital lines to any port on a private branch exchange or Centrex switch and supports the existing system's calling features.

The wall-mountable controller has a maximum coverage area of 800,000 square feet, depending on traffic and building characteristics, and supports as many as 71 base stations, each with a coverage radius of 120 feet.

However, sometimes the coverage radius varies. NTI uses a controller in a 1.3 million-sq.-ft. Research Triangle Park, N.C., facility that uses 50 base stations to support 40 portable phones.

The base stations are linked to the controller, which can be located 2,600 feet away, via standard twisted-pair wire. A base station can support two radio channels, each of which can handle one conversation.

The Companion phones, which have standard push-button keys and several special functions, can operate for as long as six hours. The Companion portable phone can be used independently or twinned with a standard business phone. When twinned, both devices ring when called.

NTI is not the first vendor to announce a wireless telephone system. SpectraLink Corp., a Boulder, Colo., start-up, last year announced a wireless adjunct system that can support a maximum of 2,000 lines and 400 simultaneous calls.

> NTI said it has received more than $1 million in orders in the Hong Kong area.
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The PBX vendor said it has received more than $1 million in orders in the Hong Kong area and more than 200 Companions are undergoing trials in Asia, Canada, Europe and the U.S.

NTI has not yet set pricing for the Companions.

Worth Noting

"It's to vendors' benefit to generate a sense that there will be standardization [for data access] when there won't be. They know full well it won't happen."

Rich Finkelstein
President
Performance Computing, Inc.
Chicago

Store & Forward

Easel Corp. recently announced a new version of its client/server application development tool developed using SmallTalk, an object-oriented programming language. Available next month, the product costs $3,995.

Bluebird Systems announced at Comdex/Fall a document imaging management system that runs on IBM's RISC System/6000 servers and Windows personal computer clients. Called Imageable, the client/server system supports functions such as image scanning. Available in January, Imageable costs between $1,000 and $3,000 per seat.

Beame & Whiteside Software, Ltd. announced at Comdex/Fall that its Transmission Control Protocol/Internet Protocol software for DOS and Windows personal computers directly supports Oracle Corp.'s SQLnet data access software. BW-TCP Version 3.0, which provides TCP/IP services for Windows PCs, costs $245. BW-Network File System (NFS) Version 3.0, which provides DOS and Windows users access to NFS servers, costs $349. Both are available now.

(continued on page 32)

Software AG's ADABAS to get database replication

Technology is alternative to two-phase commit.

By Wayne Eckerson
Senior Editor

RESTON, Va. — Not to be outdone by Sybase, Inc., Software AG of North America, Inc. has announced it will ship by year end software that offers an alternative to two-phase commit technology for distributed databases.

Called the Entire Transaction Propagator, the software will enable users to replicate transactions performed in a master database to multiple databases on a network. That will ensure concurrence of data across an enterprise network.

The product is an add-on to Software AG's Adaptable Database System (ADABAS), which runs on IBM hosts, Digital Equipment Corp. VAX/VMS, Unix and OS/2 platforms.

Analysts say replication is a valuable tool for companies that need to update distributed databases but not necessarily in real time. Two-phase commit, which is deployed in most database products, requires all databases to be updated simultaneously.

Earlier this month, Sybase announced with much fanfare a new product called the Replication Server that provides much the same replication services as the Entire Transaction Propagator except it works with Sybase's SQL Server databases. The Replication Server is expected to go into beta test by year end.

"When we found out [Sybase] was talking about a product we had in beta and making a big deal about it, we decided it was time to announce [Entire Transaction Propagator]," said Mike Schiff, director of Software AG's data management program.

"The product is not rocket science, but it fulfills a major need," he added. "There's nothing wrong with two-phase commit,

(continued on page 32)

Lotus Notes users unite to establish association

By Wayne Eckerson
Senior Editor

SUDBURY, Mass. — Work groups unite! Users of Lotus Development Corp.'s Notes work group computing software have banded together to establish the Worldwide Association of Lotus Notes Users and Technologists (WALNUT).

The newly formed association hopes to establish as chapters a number of informal Notes user groups that have cropped up this year in many U.S. metropolitan areas, including Boston, New York and Washington, D.C.

Released in 1989, Lotus Notes is now used in more than 1,000 companies worldwide, according to Lotus officials.

On-line database

WALNUT will assume responsibility from Lotus for maintaining an on-line Notes database that provides in-depth information about Notes and allows users to share experiences in developing, implementing and maintaining Notes and related applications.

It will also produce a Lotus Notes newsletter, help regional groups start WALNUT chapters and provide members with discounted admission to the annual LotusWorld conference and exposition in May.

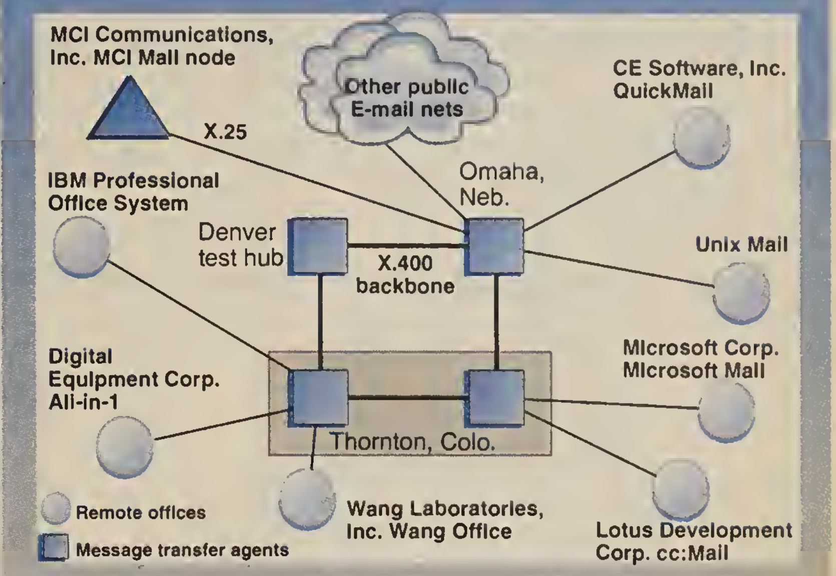
"The purpose of WALNUT is to allow Notes users to exchange information about their experiences with Notes, provide education and training, and preview members about upcoming enhancements to Lotus Notes and news from Lotus' Alliance Partners and value-added resellers," said Kevin Brown, director of strategic sales for Corporate Software, Inc. in Canton, Mass., and acting president of WALNUT.

WALNUT will be administered by Danieli & O'Keefe Associates, Inc., an association management group based here.

Membership registration begins Jan. 1.

For more information, call David Dimmick at Danieli & O'Keefe at (800) 524-1858. ◻

US West's M-Net


MCI Communications, Inc. MCI Mail node
Other public E-mail nets
CE Software, Inc. QuickMail
X.25
Omaha, Neb.
IBM Professional Office System
Denver test hub
X.400 backbone
Unix Mail
Digital Equipment Corp. All-in-1
Microsoft Corp. Microsoft Mail
Thornton, Colo.
Remote offices
Message transfer agents
Wang Laboratories, Inc. Wang Office
Lotus Development Corp. cc:Mail

MessageNet (M-Net) system uses Unix-based X.400 gateways to switch messages and link disparate E-mail systems among US West offices in 14 states.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: US WEST, INC., DENVER

US West ties together diverse E-mail nets

Messaging format handles address conversion among more than a dozen proprietary systems.

By Timothy O'Brien
West Coast Bureau Chief

DENVER — US West, Inc. is putting the finishing touches on a corporatewide messaging infrastructure that links more than a dozen proprietary electronic mail systems in use at US West locations in 14 states.

As part of the MessageNet (M-Net) effort, which began in 1986, US West created an internal messaging format called Compound Message (CM) that handles address conversion between the different systems. The CM format is now used in conjunction with X.400 to process hundreds of thousands of messages monthly.

At the heart of M-Net are three Tandem Computers, Inc. fault-tolerant Unix machines that serve as regional hubs handling all conversion and routing of messages among disparate mail systems. These hub machines run X.400 gateway and server software from Vancouver-based OSIware, Inc.

"In order to give users their choice of E-mail in their local environment, we recognized that we would be supporting proprietary systems for a while," said Ron Sherman, Open Systems Interconnection specialist for M-Net. "However, we also wanted to move toward X.400 to minimize the systems supported."

Until recently, M-Net was used only for the task of switching between different messaging systems, such as Digital Equipment Corp.'s All-In-1, Microsoft Corp.'s Mail, IBM's Professional Office System, CE Software, Inc.'s QuickMail and various flavors of Unix mail. The system has now evolved into an infrastructure that carries the bulk of the company's messaging traffic.

"Last June, we logged 343,000 messages through M-Net, which we estimated at the time was only 20% of all messages sent internally," Sherman said. But now, 80% of all messages within US West are switched through M-Net.

> "We wanted to move toward X.400 to minimize the systems supported."
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One of M-Net's hub machines is located at a data center in Omaha, Neb., with the other two housed in Thorton, Colo. US West uses X.25 links to connect remote sites to the hubs.

(continued on page 32)

US West ties together diverse E-mail nets

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In addition, a test hub is located in Denver for prototyping new applications before they are implemented on the production machines. These Unix machines run OSIware's Messenger 400 (M400) Message Transfer Agent (MTA) software, which provides gateway services, switching of messages from different E-Mail systems and document conversion services.

Using OSIware's M400 Gateway Application Programming Interface (API), US West was able to build gateways on its production hub machines for E-mail systems that did not provide X.400 connectivity.

In order to accommodate some of US West's special requirements for routing and processing of messages, OSIware and the M-Net development team came up with a hybrid MTA configuration that allowed two M400 MTAs — one for inbound and one for outbound messages — to run on the same machine.

The inbound MTA handles messages that are being directed through the gateways using the M400 APIs. After processing, the messages destined for X.400 mailboxes are placed in the outgoing MTA. That helped the carrier optimize processing and boost throughput.

US West created the CM internal message protocol as a common format to which proprietary message addresses can be mapped and translated. Additional information about the originator and recipient of messages is stored in CM directory services.

For transparent access to directory services, the M-Net system updates directory information on each of the connected E-mail systems nightly. Users do not need to know what path the message has to take to get to another E-mail system on the net.

Even though CM is still useful for proprietary systems, US West is now trying to use X.400 wherever possible. The company believes the experience gained from working with OSI technology in its M-Net system will allow it to adopt standards-based solutions for messaging in the future with minimal disruption to users.

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Store & Forward

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Unisys Corp. and **Sybase, Inc.** recently announced an agreement to port Sybase's SQL Server relational database management system to Unisys' U 6000 Unix servers running Unix System V operating system software.

Unisys also announced it is porting Mapper, its fourth-generation language, to IBM's AIX and The Santa Cruz Operation, Inc.'s SCO Unix operating systems. The new Unix tools will be available in the second half of 1993 at prices ranging from approximately $2,200 to $160,000.

ADABAS to get database replication

continued from page 31

but it's overkill for most users."

The Entire Transaction Propagator logs each transaction on a master ADABAS database and then at a predefined time — whether one second, one hour or one day later — distributes them for processing at other databases. If a network node does not respond immediately, the transaction is logged and distributed at a later time.

Schiff said 80% of companies that want distributed database functionality should use replication, not two-phase commit. Most companies place vital information, such as prices or telephone numbers, in a master database at a central site and want to replicate all or part of that data to secondary databases in the field. They generally do not need transactions to be distributed simultaneously to all databases.

For example, a nationwide retailer can change prices in its master database and then replicate those changes in databases at each of its stores that night when network charges are lower.

In contrast, certain transactions, such as those involving funds transfer, must be handled using two-phase commit to ensure transactional integrity. Two-phase commit requires that all databases in a network be able to perform a transaction before the transaction is committed.

"Replication allows companies to do distributed work without the problems of deploying fully distributed systems with two-phase commit," said Richard Finkelstein, president of Performance Computing, Inc. in Chicago. "It eliminates a lot of headaches, but it can introduce some problems in keeping databases synchronized."

He said that while Entire Transaction Propagator is a nice feature, it's unlikely to boost sales of ADABAS because the database is not relational in structure.

INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS, ALLIANCES AND FINANCIALS

Worth Noting

International Telemanagement, a Vienna, Va., vendor of enterprise management systems, has changed its name to MAXM Systems Corp. to reflect the name of its MAXM product line.

People & Positions

Mike Hallman, who resigned earlier this year as president and chief operating officer at Microsoft Corp., has been named to the board of directors at start-up **Networx, Inc.** of Bellevue, Wash. Networx, which was formed by several former employees of The Boeing Co., is a vendor of automated trouble-ticketing application software.

Hallman, now an independent consultant in Redmond, Wash., is familiar with Networx's technology since he was a Boeing vice-president and president of Boeing Computer Services before joining Microsoft.

Hallman said he hopes to provide insight to the Networx management team based upon his experience with both user and vendor organizations.

Data General Corp., a Westborough, Mass., minicomputer and server vendor, has named **Ladd Bodem** as the company's vice-president of professional services.

He will direct the company's Professional Services Group, which provides users with systems integration services, software application development, consulting, network planning and facilities management.

Bodem was at Digital Equipment Corp. for the past 15 years in a variety of marketing and systems integration positions. ◻

WilTel pulls out ahead in frame relay market race

Front-runner captures 38% of market service.

By Bob Brown
Senior Editor

Frame relay pioneer WilTel, the first carrier to deliver a frame relay service, looks as if it will be rewarded with the biggest share of the market this year, according to Dataquest, Inc., a market research firm in San Jose, Calif.

Tulsa, Okla.-based WilTel will snag 38% of the 940-port frame relay service market for 1992, the first full year in which frame relay services have been available, said Joe Noel, a principal analyst at Dataquest and a former employee with MCI Communications Corp.'s frame relay group.

WilTel leads a pack that includes AT&T, BT North America, Inc., CompuServe, Inc., MCI and Sprint Corp. (see graphic, this page). It owes its lead largely due to being first to market in March 1991, Noel said.

Market research from other firms, including The Yankee Group in Boston, also rank WilTel on top. Jennifer Pigg, program director for data communications at The Yankee Group, said WilTel will garner about 40% of the 150 frame relay customers signed on by the end of this year.

Beating its larger rivals to the punch has turned out to be significant because WilTel has priced its service aggressively, forcing others to do the same, Noel said.

Kaye Hack, product manager for WilTel's WilPak frame relay service, said the key to WilTel's success will be to continue focusing on educating users and growing its expertise in local-area network technology since LAN-to-LAN interconnection is the top frame relay application. Support for international sites will also be important, she noted.

While the market has not taken off as quickly as some observers had expected, Hack said the number of WilTel's customer frame relay nodes has been growing 20% each month this year and shows no sign of letting up.

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INDUSTRY BRIEFS

NJ Bell trials video. New Jersey Bell Telephone Co. recently announced a 10-year agreement to give cable television provider Sammons Communications, Inc. CATV transport in three New Jersey communities.

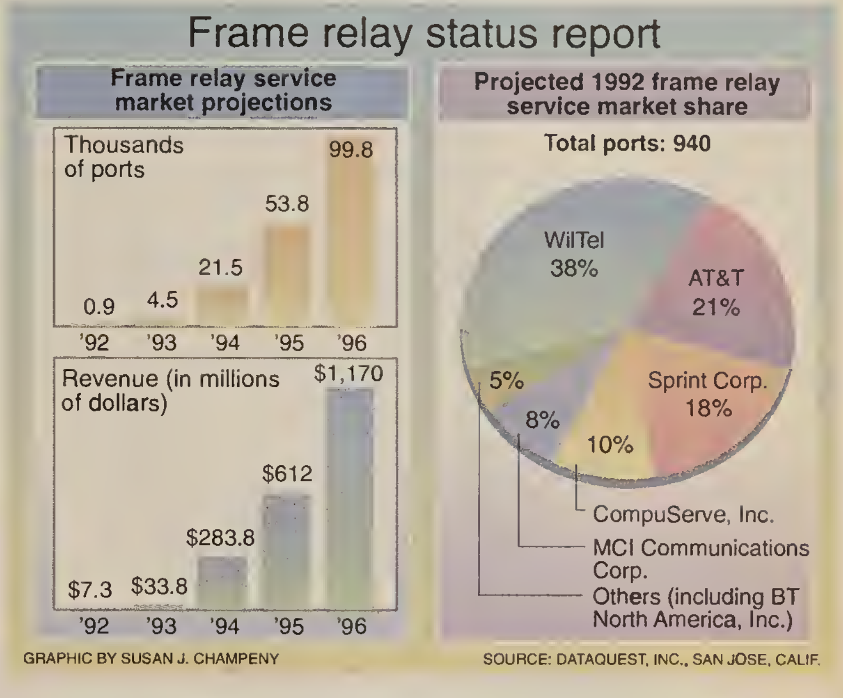
Under the video dial-tone deal, touted as the first of its kind in the U.S., New Jersey Bell will build a fiber optic-based system to provide telephone service to 11,700 households in Morris County, N.J., as well as digital transport and distribution services for Sammons' 8,000 customers.

CrossComm shows record growth. CrossComm Corp., a Marlborough, Mass., bridge and router vendor specializing in token-ring networks, announced third-quarter revenue of $7.6 million, up 69% from the corresponding quarter last year. Earnings for the quarter more than tripled to $741,000.

NET continues comeback. Network Equipment Technologies, Inc., a Redwood City, Calif., maker of multiplexers and other network gear, reported revenue of $54 million for its second 1993 fiscal quarter ended Sept. 27, up 28% from the same quarter last year. Earnings were $1.6 million, a turnaround from a second-quarter loss of $12.6 million last year. That loss was largely due to a charge of $13.4 million resulting from the settlement of consolidated class action lawsuits brought against the company in regards to its financials.

Spider spins OEM web. Spider Software, the Edinburgh, Scotland-based communications software division of Spider

(continued on page 36)



GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: DATAQUEST, INC., SAN JOSE, CALIF.

AT&T protests NREN ATM service contract

Complains DOE requested an SMDS proposal but awarded Sprint contract for ATM service.

By Ellen Messmer
Senior Correspondent

WASHINGTON, D.C. — The Department of Energy's National Research and Education Network (NREN) contract for Asynchronous Transfer Mode (ATM) services, which was awarded in August to Sprint Corp., is being jeopardized by a protest from AT&T.

AT&T claims the DOE asked for Switched Multimegabit Data Service (SMDS) in its request for proposal but chose Sprint to provide a different service — T-3-speed ATM. The General Accounting Office (GAO) has not yet ruled on the AT&T protest, but Sprint emphasized that it still plans to deploy commercial ATM services nationally in 1993, even if it loses the NREN contract.

The DOE recently said it has been delayed in its plans to upgrade the T-1 Energy Sciences Network (ESnet) to 622M bit/sec speed by 1996 due to the protest over the five-year, $50 million ESnet Fast Packet Contract.

An initial goal of the Fast Packet Contract is to upgrade ESnet and the National Aeronautics and Space Administration networks to cell-based services at T-3 speeds. But the contract's larger goal is to spur development of gigabit networking.

The U.S. government, as a large user test site, will purchase cell relay services ranging from 45M to 622M bit/sec by 1996 from a carrier that will make them available commercially.

"I doubt that 1996 will come with the NREN attached at gigabit speed, but it's a nice goal," said Ari Ollikainen, a network technology analyst for the Lawrence Livermore National Laboratory's National Energy Research and Supercomputing Center.

Ollikainen alluded to protest problems during a presentation on the DOE's NREN contract at the Broadband Networks Conference here. But he declined to disclose the name of the vendor or the nature of the protest.

Both sides of the protest have kept unusually quiet until now, perhaps because no one is eager to court controversy on the first NREN contract.

However, AT&T recently acknowledged that it is the source of the protest, which could derail the DOE's current plans to build a gigabit-speed network.

On Sept. 25, AT&T protested the award to Sprint on the grounds that the DOE chose a vendor to supply services that were not listed in the RFP issued by the agency.

The DOE RFP specified starting with SMDS and migrating to ATM, said Richard Lombardi, vice-president of AT&T business communications services for federal systems. "But that's not how

(continued on page 36)

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Sources: Dataquest Ledgeway, 7/92; COMPAQ News Release, 10/5/92.

[#] Applies to COMPAQ ProSignia™, COMPAQ SYSTEMPRO®/XL and associated options only. This service, provided by contracted service providers, may not be available in certain geographic locations.

IBM®

WilTel pulls out ahead in market race

continued from page 33

Despite such growth, WilTel's stay at the top of the market is expected to be short-lived, Noel said. AT&T, which, according to Dataquest, has 21% of the market, will move out in front by next June.

"I think WilTel got a certain protest vote from early adopters who don't mind going with a less traditional carrier," Noel said. "But I don't see any way WilTel can stay ahead of the pack, given that AT&T has too many big customers that will stay with AT&T no matter what."

Both AT&T and WilTel will also face competition from other carriers, although questions linger about some of them.

Noel said he is watching MCI since there have been numerous personnel changes in its frame relay group as part of its recent broader company reorganization.

The main question about Sprint has to do with its frame relay network switches, Noel said. The switches are perceived by some in the industry to be old technology compared to offerings from StrataCom, Inc. and Siemens AG, one or the other of which is used by most of the other frame relay service providers, he said.

Noel described CompuServe as a surprisingly strong player in the frame relay market, given that the company is typically more prevalent in consumer services rather than business services such as frame relay.

BT North America has a fair number of customers, but most of them have only a few frame relay ports, Noel said. As a result, that firm is lumped into the "others" category in Dataquest's rankings. However, its emphasis on the international market, where it is the first U.S. carrier to play, could greatly improve the carrier's market share.

In BT North America's own research, the company comes up third behind WilTel and CompuServe with 13% of the market based on number of customers. The company's survey did not include AT&T and MCI, due to their later start-up dates.

Among the potential service differentiators going forward will be support for IBM Systems Network Architecture traffic across frame relay networks, Noel said. ◻

AT&T protests NREN ATM service contract

continued from page 33

the DOE judged the proposals," he added. "It appears to have selected a vendor proposing to bypass SMDS with the fastest path to ATM. That's not what it asked for."

Last week, AT&T filed comments with the GAO on a statement DOE submitted in early November regarding the contract.

A glimpse into the DOE RFP, which runs into several hundred pages, reveals that the department wants cell relay-based long-distance services, stating that the user interface should initially conform to SMDS. But at least one clause suggests the agency would apparently make an exception for "direct ATM access," provided that "significant advantages" would result.

The GAO must decide whether the DOE was out of bounds in accepting Sprint's proposal to provide a nonstandard version of T-3 ATM based on the ATM Forum specification. ◻

Industry Briefs

continued from page 33

Systems, Ltd., has announced OEM agreements with three firms: Hitachi Computer Products, Inc., Tandem Computers, Inc. and Performance Technologies, Inc. (PTI).

Hitachi will use Spider's SpiderTCP and SpiderOSI communications software on its mainframe-to-local-area network gateways.

Tandem has licensed Spider's X.25, Transmission Control Protocol/Internet Protocol and Unix software for use on its Integrity fault-tolerant computers.

In addition, PTI has licensed Spider's X.25 software for use on PTI's controller.

ITU offers documents on-line. The International Telecommunication Union (ITU) this month launched an electronic distribution service in order to provide remote access to ITU documents.

The Teledoc database is based on an X.400 document server that processes requests sent by electronic mail by using the X.400 or Internet Protocols as well as gateway services. It now contains Consultative Committee on International Telephony and Telegraphy and International Radio Consultative Committee (CCIR) administrative documents, technical proposals and other information.

For more information or copy of a user's guide, contact Robert Shaw, Teledoc project coordinator in Geneva, at 41-22-730-5338 or fax 41-22-730-5337. ◻

"Uh-Oh . . ." *Donna, Accounting*

"What The . . ." *Dan, Drafting*

"Hey!" *Todd, Shipping*

"Whoa!" *Jan, Production*

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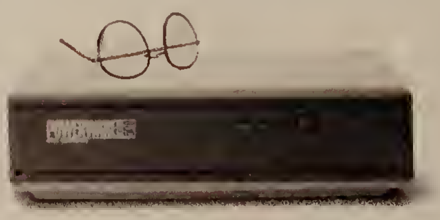

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Worth Noting

"Video technology is going to improve as companies put more money into R&D. And as people start to buy more products, the prices are going to come down. In three or four years, I think we should be able to buy a good videotelephone for $50."

Shaku Atre
President
Atre, Inc.
Rye, N.Y.

Manager Minutes

The **Client-Server Round Table (CSRT)** will hold a series of workshops on client/server networking on Dec. 7 in Chicago.

CSRT, a consortium of users and vendors chartered to foster usage of client/server computing through education, is holding the workshops in conjunction with the Database World and Client-Server World trade shows, which open there the following day.

The workshops include Managing Transition, Technical Issues in the Transition, Applications for End-User Information Access and Client-Server Case Tools.

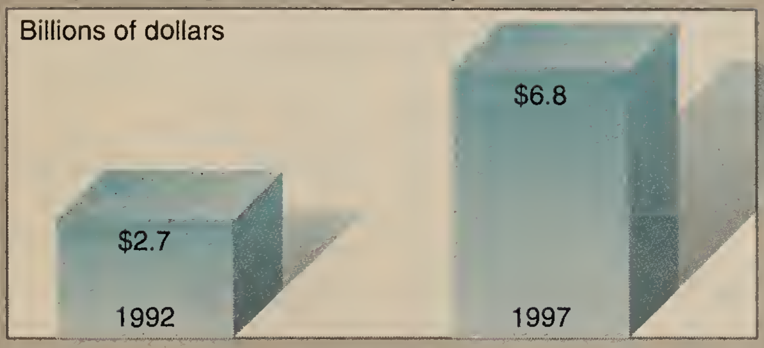
The program costs $125 for CSRT members and $175 for nonmembers. All attendees will receive $100 off the full price of attending both shows.

In addition to the workshops, CSRT is planning to offer the first in a series of technical white papers on client/server computing.

For more information, contact CSRT at (800) 243-5123. ◘

Users look to outsource net management

Spending on network management outsourcing is expected to grow at a 20% compounded annual rate.



INPUT expects growth in applications such as client/server, video and image networking to spur the trend.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: INPUT, VIENNA, VA.

Brightwork, ATEC offer courses for managing LANs

Classes designed to augment Novell CNE training.

By Joanne Cummings
Senior Writer

TINTON FALLS, N.J. — LAN tool developer Brightwork Development, Inc. and the Association of Technical Education Centers (ATEC) announced they are jointly offering courses to help users more proactively manage local-area networks in large enterprises.

The courses are designed to augment Novell, Inc.'s Certified NetWare Engineer technical training with pragmatic management-oriented skills, according to Greg Gianforte, president of Brightwork. They were developed by Brightwork engineers and will be offered in as many as 70 ATEC locations across the country.

"We found that there are basically two types of people charged with administrating LANs," Gianforte said. "The first comes from a data center background. They realize the importance of such issues as daily data backups and hot spares, and just need to learn how to transfer that knowledge to the LAN environment."

The second group has grown up from the end-user side. "When we approach them with the same issues, they are surprised that nobody's told them about them before," he said. "There's a knowledge gap there that we're trying to fill."

The first two courses will be offered in February. Software Metering and Asset Management: Issues and Solutions is a one-day course that explores such topics as software licensing agreements, the legal issues surrounding software copyright violations and virus control, as well as the cost/benefits of software metering and asset management. It costs $395 per attendee.

The second course, called Advanced Printing on NetWare Version 3.11, is a two-day class that provides an in-depth overview of printing in a NetWare environment. It offers a brief refresher on NetWare print utilities, installation procedures and remote printing, and it also includes hands-on training for installation and configuration procedures, troubleshooting and print management of DOS and Windows applications. It costs $795.

Two more courses will be available in the spring. One, called Disaster Planning and Recovery, will address issues such as hot sparing, examining potential points of failure and figuring tolerable downtime for LAN applications.

The other, called Practical Network Management: Tips and Techniques, will address LAN operational techniques, troubleshooting tips and ways to set up an internal help desk. Pricing has not been set for these courses.

Brightwork recently offered a beta class to test its curriculum and get a better idea of how the course should be structured. Attendees of that class seemed generally pleased, citing interesting course materials and good instructors.

For more information about the courses, contact Brightwork at (800) 552-9876. ◘

Mobile computing wares bow at show

Comdex demos feature several products that promise easier access to apps from the road.

By Joanne Cummings
Senior Writer

LAS VEGAS — Bringing your office on the road is about to get a lot easier thanks to a slew of emerging technologies, many of which were demonstrated at the Comdex/Fall conference here.

The show highlighted a variety of wares based on AT&T Microelectronics' Hobbit microprocessor and GO Corp.'s PenPoint mobile operating system that promise to let users more easily access their traditional office applications from the road.

Topping the list was a demonstration of the AT&T Personal Communicator 440, a pen-based, hand-held device developed by start-up EO, Inc. of Mountain View, Calif., that accepts information input using a stylus. AT&T, which is marketing the unit, is a primary investor in EO.

The 440 can be equipped with either a 9.6K bit/sec modem or a cellular telephone, both of which enable users to send and receive electronic mail and facsimiles over the traditional phone network or the cellular network.

Because it is based on the Hobbit chip, the device is smaller and lighter than most portable computers, measuring just 11 by 7 by 1 inches and weighing two pounds, AT&T said.

To support the communications functions, the device has PenPoint and other necessary software loaded in read-only memory. It also has 4M bytes of random-access memory, expandable to 12M bytes.

Preloaded software includes GO Mail, a pen-based version of AT&T Mail developed by GO in partnership with AT&T Easylink Services, and GO Fax, a calendar and note-taking application.

The device has a serial port that can be used to connect it to any IBM-compatible computer for exchanging data. It also has a parallel port for linking with a printer or optional floppy drive, a port for a keyboard connection and a standard phone jack.

The 440 will be available in the first quarter of next year and will be distributed by AT&T Phone Centers. It ranges in price from $1,999 for a model without the modem or phone options to $2,899 for a fully equipped device.

Apps for PenPoint users

Another vendor, Notable Technologies, Inc. of Oakland, Calif., introduced two software applications designed for Hobbit-based portable computers running the PenPoint operating system.

Mobile Access enables PenPoint computers to emulate terminals and access a variety of host computers.

▲▲▲

The applications, called Mobile Access and Shared Whiteboard, both take advantage of PenPoint's graphical user interface and provide mobile users with communications abilities.

Mobile Access enables PenPoint computers to emulate terminals and access a variety of host computers. Terminal emulations supported include Digital Equipment Corp. VT-52 and VT-100, as well as TTY.

The software, which offers handwriting recognition for entering text, enables users to capture text from the host or another mobile computer. Available in the first quarter, Mobile Access is priced at $195.

Shared Whiteboard enables mobile users to interactively create and annotate document images. It allows users of PenPoint-based computers that are linked to one another via a wireless or wire-based connection to add to or edit a document image. Pen strokes are transmitted instantly from one device to the other, so both users see the same image. In

(continued on page 63)

OPINIONS

FRAME RELAY

BY KATHRYN KOROSTOFF

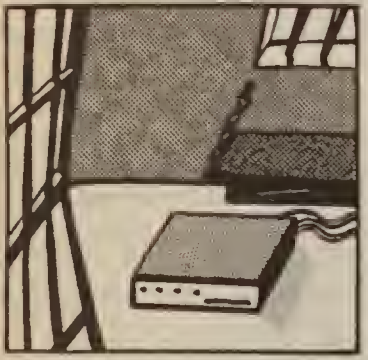
Is frame relay just getting a bad rap?

Frame relay is being sent up the river for the crime of failing to live up to expectations. But is it really being framed?

Consultants, analysts, vendors and the press are equally to blame for the crime of setting unrealistic expectations for frame relay. And now, looking at evidence of lackluster sales, we're all quick to give frame relay a tainted image.

So what happened? Why hasn't the market taken off? To answer those questions, let's reconstruct the crime scene.

First of all, frame relay is new to the market, and new entrants to any market traditionally start off slowly. While leading-edge users may test out frame relay, the vast majority of users watch and wait for evidence of benefits before they make purchases. So far, feedback about the technology from leading-edge users has been mixed.



Frame relay was touted as the best technology for reducing communications costs and handling bursty data traffic. Its ability to statistically multiplex traffic from multiple users reduces total bandwidth requirements and, therefore, carrier costs. It also provides access to unused bandwidth as needed — an important feature for traffic with irregular patterns.

But early implementations did not provide great burst capability. Instead of allowing access to unused bandwidth for long bursts, early implementations only supported short bursts, often measured in milliseconds. As a result, early reports stated that frame relay was not meeting expectations.

Clearly, CCITT and ANSI frame relay standards provide for both bandwidth reduction and sustainable burst support. Some vendors, such as Cascade Communications Corp., Frame Relay Technologies, Inc. and Network Equipment Technologies, Inc., have products that implement these standards and deliver both frame relay benefits. However, other vendors' frame relay implementations only provide bandwidth efficiency and do not provide strong burst support.

So users need to decide if they want both benefits before casting a guilty vote against frame relay. If your greatest concern is minimizing bandwidth, you have various products from which to choose. If you are equally concerned about getting burst capacity, your selection is more limited.

Another recent event hindering frame relay demand is a drop in long-haul T-1 prices. The reduction changes the economic justification formula for users looking at public frame relay as an alternative to a T-1 line or as a way to drop bandwidth needs from a full T-1 line to a fractional T-1 line. Lower T-1 prices make the payback period for frame relay longer and, thus, more difficult to cost-justify.

Indeed, frame relay won't solve every communications problem ever encountered. But it is a good choice for most users' noncontinuous rate traffic because it can cut carrier costs and provide burst capability. Let's not give this important new technology a bad rap because early expectations were set too high and early implementations were limited.

Korostoff is a principal consultant at Strategic Networks Consulting, Inc. in Rockland, Mass. She can be reached via MCI Mail at KKorostoff.

NETWORK WORLD

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Assistant Managing Editor — News
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Senior Editors/News Coordinators
Bob Brown — Industry Update
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Caryn Gillooly — Local Networking
5423 Gladewright Drive
Centreville, Va. 22020
Phone: (703) 266-1537
Fax: (703) 266-1543

Senior Editors
Jim Duffy — Data Net Architectures
Michael Cooney — Data Net Architectures
14701 Bentley Square
Centreville, VA 22020
Phone: (703) 830-8138
Fax: (703) 830-7963

Senior Writers
Joanne Cummings — Management Strategies
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67 Highgate Road
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Phone: (508) 481-6061
Fax: (508) 485-5809

Maureen Molloy — Internetworks

Staff Writer
Skip MacAskill — Internetworks

West Coast Bureau
Timothy O'Brien
Bureau Chief/Enterprise Applications
2088 Union Street, Suite 2
San Francisco, Calif. 94123
Phone: (415) 771-3530
Fax: (415) 771-2817

Washington D.C. Bureau
Anita Taff
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Phone: (202) 879-6744

Ellen Messmer — Senior Correspondent
National Place
1331 Pennsylvania Ave. NW, Suite 505
Washington, D.C. 20004
Phone: (202) 879-6752

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Network World
161 Worcester Road
Framingham, Mass. 01701
(508) 875-6400
MCI Mail — 390-4868
Fax: (508) 820-3467
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EDITORIAL

Breaking with the past in application design

It's time to get smart about application design.

Too many companies continue to develop applications using old assumptions and practices that spawn a plague of problems in the client/server or distributed worlds.

It's true that bandwidth is becoming more and more plentiful and MIPS keep getting cheaper, and those trends can mask a multitude of design ills today.

But users relying on increasing network and computing power to solve distributed application problems in the future would do well to remember a simple rule posited by Michael Goulde, senior consultant with Boston-based Patricia Seybold Group, Inc. during a Comdex/Fall presentation.

"Even with good application design, the growth of distributed applications easily keeps pace with the availability of bandwidth."

Pay particular attention to that initial clause. Good — that is, network-intelligent — application design is critical. Without it, you'll face performance problems and unhappy end users no matter how many bits per second you're throwing at the application.

Networked applications have to be smart about how they respond to service requests and deliver information, Goulde says.

That means, for example, only bringing objects, say, images, in a compound document down to the workstation as you need them — delivering only the database records you need and not the whole database — or optimizing where you do database joins.

Developers have to become more attuned to the network ramifications of their design decisions. They have to take steps to minimize traffic and use the processing power distributed across the network to its best advantage.

As applications continue to be built atop the network platform, it will be imperative for developers to identify software approaches to reducing bandwidth demands, Goulde says.

Without smart application design, even the most intelligent networks will wind up looking pretty dumb.

OPINIONS

SECURITY PERSPECTIVES

BY MICHEL KABAY

Protect LANs from the X-ray vision of LAN monitors

With his X-ray vision, Superman could peer through a variety of otherwise unpenetrable objects, such as concrete walls or steel safes. But he never misused this power to take a glance at anything that wasn't his business.

Too bad that hackers using local-area network monitors as the equivalent of X-ray vision don't have the same scruples as Superman. These hackers are tapping LAN cables and stealing valuable information. Unencrypted LAN communications are completely open to anyone with a few hundred dollars to spend on off-the-shelf software.

Worse still, no one seems upset about it.

The problem is the easy availability of LAN monitoring software. Judge for yourself: Network monitor vendors are advertising a variety of features that can be a lure to anyone who wants to break into your net.

Some vendors tout their products' ability to fully decode Novell, Inc.'s Internetwork Packet Exchange/Sequenced Packet Exchange (IPX/SPX), Transmission Control Protocol/Internet Protocol and Apple Computer, Inc.'s AppleTalk packets on any Ethernet network.

These vendors also play up the monitor's ability to fully decode packets in tabular format and present the information in English as opposed to binary form. Moreover, vendors say a monitor makes light work out of giving cryptic node addresses more understandable node/user names and builds sophisticated packet filter specifications.

These functions are supposed to help users determine the source of a fault on the network by listening to network conversations. And best of all, some products reside on a single floppy disk, making it easy to bring to various sites and run on any workstation.

There's the problem. An off-the-shelf program whose existence is impossible to detect can be loaded onto any workstation that has a floppy disk drive. This workstation can now decode any packet going by on the network. That includes packets being sent from a workstation using the LAN to connect to a minicomputer or mainframe and such secure information as passwords, file lockwords — and worst of all — the encryption keys used to encrypt or decrypt secure files on servers.

> Network monitor vendors are advertising features that can be a lure to anyone who wants to break into your net.
>
> ▲▲▲

By selecting a particular node — say, the system manager's workstation — the person using such a monitor can follow every single interaction on that workstation.

The person could, for example, watch for the initial dialogue used at logon, including the invisible password scooting along in its little packet from the system manager's workstation to the host.

LAN monitor software lets a user automatically trap packets by specific nodes and strings, for example, LOGIN. Such macro functions record the chosen data stream without human intervention. The log files can then be examined off-line at leisure.

Because LAN monitors only read network data, they do not interfere in any way with the data stream, so there is simply no way for a network supervisor to tell that someone is decoding packets.

One way to foil a hacker with a LAN monitor is to encrypt data at each node on the LAN so that only encrypted data is transmitted across the LAN to servers.

Another solution is to make the use of LAN monitor software visible to network managers. The National Computer Security Association urges manufacturers of LAN operating systems and LAN monitor programs to work together in order to establish a way for such software to emit standard packets that can be forbidden on the net without authorization from network managers.

This will give users a viable tool to permit the legitimate use of LAN monitors while preventing hackers from stealing sensitive information.

Until the industry responds to this gaping hole in LAN security, users should encrypt all LAN transmissions or continue to be at risk from unscrupulous eavesdroppers using easily accessible software.

In the meantime, all LAN managers should control the use of LAN monitor software to prevent abuse.

Superman may no longer be with us, but X-ray vision lives on. ◻

Kabay is director of education with the National Computer Security Association in Carlisle, Pa.

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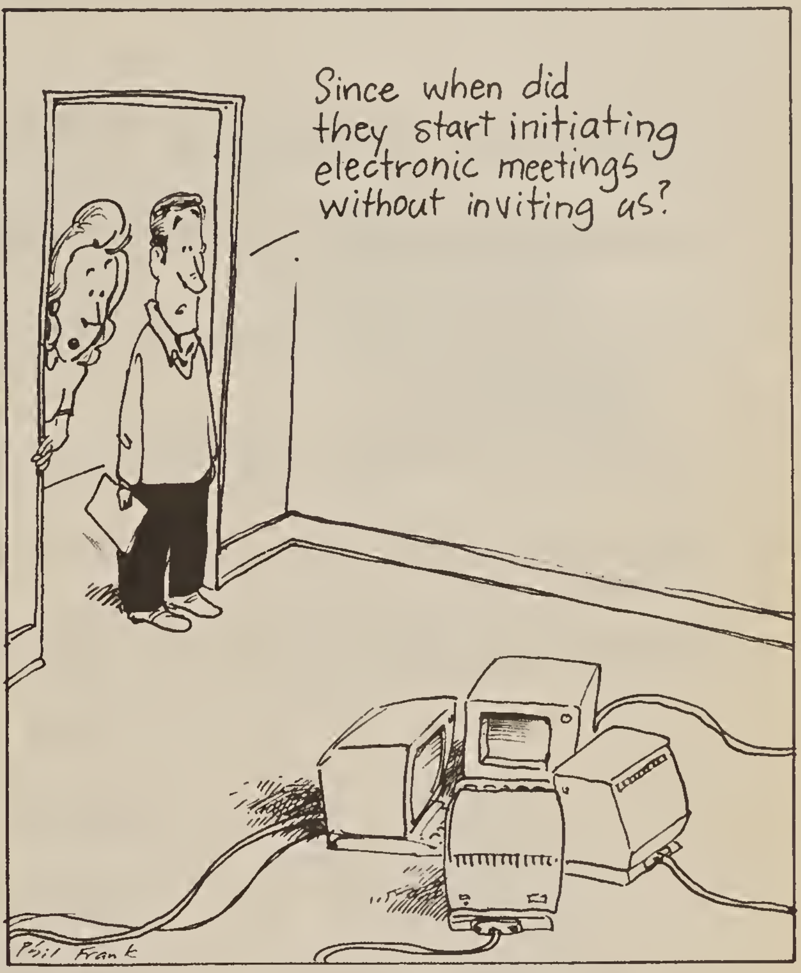
TELETOONS

BY FRANK AND TROISE


Since when did they start initiating electronic meetings without inviting us?
Phil Frank

LETTERS

Unavailable products in test

In response to the last Network Security Test Series article ("'Scanners' ability to remove virus in memory found wanting," *NW*, Oct. 26), we would like your readers to know something about ViruSafe.

We assume *Network World* was not informed that some of the products included in the test are only available overseas and cannot be purchased in the U.S. One of these products is ViruSafe Gold from Eliashim Microcomputers.

However, XTree Co. has the right to distribute Eliashim's ViruSafe products in the U.S. We currently offer ViruSafe Version 4.6. Because we update and upgrade our customers with new versions quarterly, we will soon be releasing ViruSafe Version 5.0. This version is comparable to Eliashim's ViruSafe Gold that was part of the test. The new version will contain many additional features and capabilities, including those to seek and destroy a large percentage of stealth and polymorphic viruses.

Thank you for allowing us the opportunity to keep *Network World* readers up-to-date about ViruSafe and our relationship with Eliashim.

Gina Harr
Product manager
XTree Co.
San Luis Obispo, Calif.

Editor's note: Some of the products in the test are indeed owned by overseas companies. The vast majority, however, are available in the U.S. via a subsidiary company or distribution agreement.

Users who are finding it difficult to locate a particular company can call the International Computer Security Association in Washington, D.C. at (202) 364-8252 for information.

Want to respond to an article or opinion in Network World? *Mail typed letters to Editor,* Network World, *161 Worcester Road, Framingham, Mass. 01701, or fax them to (508) 820-3467. Transmit your response via MCI Mail at 390-4868 or to our Bulletin Board System. (See page 2 for BBS instructions.) Letters may be edited for space and clarity.*

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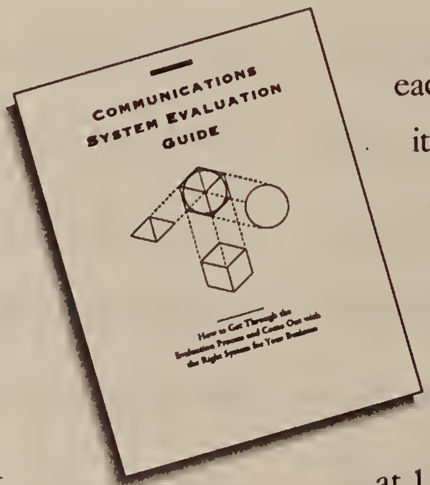
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The elusive illusion

The ability to make data at multiple sites appear as one logical database is still a bit out of reach.

Many users today are fascinated by talk about distributed database management systems that give end users the illusion that data stored at multiple sites is local. Well, right now, that's just what it is, an illusion.

Of the many vendors hawking DBMSs today, only a handful claim to offer support for data distribution. An even smaller subset have been identified by leading consultants as having what comes closest to a true distributed DBMS: Informix Software, Inc.'s Informix On-Line; Ingres Corp.'s Ingres Intelligent Database; Oracle Corp.'s Oracle 7; and Sybase, Inc.'s System 10.

While none of these products supports the full set of features required of a robust distributed DBMS, each now provides or will soon provide some distributed functionality.

Typically, a distributed DBMS consists of a vendor's base DBMS product and several software add-ons that provide distributed functionality. But some vendors offer direct distributed DBMS functions in their base-level products.

This poses a problem for prospective buyers, who quickly discover that every vendor has a slightly different definition of what constitutes a distributed DBMS.

But there is some common ground on this definition. A thumbnail sketch typically goes something like this: A distributed DBMS enables users to access information regardless of the hardware or application software used and without having to know where it resides or how to access it.

A distributed DBMS allows users to split up data tables horizontally or vertically and put the fragments on different nodes at different sites. Queries are made exactly as if the information were local.

Integrity is maintained throughout the database during transactions and during recovery and backup.

Control protocols such as two-phase commit provide locking mechanisms that assure data remains consistent. Global query optimization features automatically select the best means of carrying out complex transactions over local- and wide-area networks, and on-line performance monitors give users a view into the distributed process to allow troubleshooting and system tuning (see "The baker's dozen of key features," page 44).

The allure

Many firms looking to downsize host-based applications to distributed LANs are intrigued by the idea of parceling out central-site data. These firms would like to store the data that a site accesses most frequently at the local level yet still make it available to remote users who only need to see it occasionally.

Keeping frequently accessed data at the local level cuts down on WAN costs encountered when all data must be shipped out from a central site. Splitting the huge centralized database into smaller chunks but retaining a single logical view makes processing more efficient.

There are plenty of users looking to accomplish these goals, says Herb Edelstein, a partner with Euclid Associates, a Potomac, Md., consultancy that conducts distributed DBMS seminars.

Many seminar attendees think they need a distributed DBMS, Edelstein says. They either want to create links between databases that already exist at multiple sites or pull data off a mainframe and distribute it.

"So they say, 'Yes, I need to use a distributed database,'' Edelstein says. "But explain some of the costs associated with keeping the data consistent throughout the [distributed] database, and many of them start to have serious second thoughts."

Distributed DBMSs often lack the type of performance offered by single-site products and are difficult and time-consuming to administer. In addition, most products are just incomplete, Edelstein says.

Guy Marazain, director of computer services at La Cite Colligalle, a university in Ottawa, had a plan to distribute his database.

"Our plan was to take our database off a single back end and distribute it over several back ends," Marazain says. "We looked at Ingres, Oracle and Sybase, but we found that there was a lot of overhead that we would have to pay in terms of managing a distributed database. We found that it was cheaper — and a lot easier — to get a bigger box for the back end and keep [the data] in one spot."

Such decisions are the norm today, Edelstein and others say. To top it off, consultants generally agree that today's products contain glitches that severely diminish their usefulness.

"Potential users have to be cautious in assuming they can purchase a system from Sybase, Oracle, Ingres, Informix or any other vendor today and get distributed functionality out of it," says David McGoveran, president of Alternative Technologies, a relational database consulting and analysis firm in Boulder Creek, Calif. "There are many, many gotchas, and they all have weaknesses, places where they say they can do a distributed transaction but actually cannot.

"It is a mixed bag of offerings," McGoveran says. "Depending on which vendors you talk with, there will be little details that don't work as the system works when it's in stand-alone mode at a single site. Finding out what these are and how they affect your application is difficult."

Of the products examined

(continued on page 44)

A Guide to Strategic Purchase Decision (GSPD) provides in-depth information concerning key technology buying decisions facing network executives. A GSPD is designed to help users make a strategic buying decision that will influence the application and net management choices they will make in the future as they shape their enterprise networks.

This GSPD explores the ins and outs of the four leading distributed database management system products that will determine the extent to which users will be able to store, access and update data across an enterprise.

By KYLE NITZSCHE

Distributed DBMSs

Company/Telephone	Product	Platform	Transport protocols								Data distribution functions					Recovery	Integrity	SQL support	APIs	Transparency support				Price
		Ma = Mainframe Mc = Microcomputer Mi = Minicomputer	TCP/IP	DECnet	IPX/SPX	SNA	AppleTalk	NETBIOS	Named Pipes	ICP/SPP	Data replication	Data dictionary (local)	Data dictionary (global)	Data directory (local)	Data directory (global)	L = Lock and rollback N = Notice of failed update T = Two-phase commit	D = Declarative structures T = Triggers	P = Proprietary S = SQL-89	M = Microsoft ODBC S = SAG	Query	Update	View	Performance	
Informix Software, Inc. (800) 331-1763	Informix-OnLine	Mi, Mc	✓		✓							✓				L, N, T	D	S		✓	✓	✓	✓	$3,000 - $225,000
Ingres Corp. (800) 446-4737	Ingres Intelligent Database	Mi, Mc	✓	✓	✓	✓		✓	✓		✓[1]	✓	✓[1]	✓	✓[1]	L[1], N[1] T[1],	T	S	M, S	✓[1]	✓[1]	✓[1]	✓[1]	$4,000 - $460,000
Oracle Corp. (800) 345-3267	Oracle 7	Ma, Mi, Mc	✓	✓	✓	✓	✓	✓	✓	✓	✓[1]	✓	✓	✓	✓	L[1], N[1] T[1],	D	P, S	M, S	✓	✓[1]	✓	✓	$799 - $200,000
Sybase, Inc. (800) 879-2273	System 10	Mi, Mc	✓	✓	✓				✓	✓	✓[1]	✓	✓[1]	✓	✓[1]	L, N, T	D, T	P, S	M, S	✓[1]	✓[1]	✓[1]	✓[1]	$3,750 - $25,000

FOOTNOTE: (1) Offered as an optional feature

IPC/SPP = Interprocess Communications Protocol/Sequenced Packet Protocol
ODBC = Open Database Connectivity
SAG = SQL Access Group

SOURCE: *NETWORK WORLD*

(continued from page 43)

here, Ingres' is perhaps the most complete, consultants say. It runs on a variety of Unix platforms, as well as on Digital Equipment Corp.'s VMS, Hewlett-Packard Co.'s MPE, DOS, Microsoft Corp.'s Windows 3.1, IBM's OS/2 and Apple Computer, Inc.'s Macintosh.

It also runs on a variety of nets, including Open Systems Interconnection Transport Class 4-based nets, and provides access to other vendors' DBMSs, such as IBM's DB2, DEC's Rdb and HP's Allbase.

Most basic distributed features are offered via an add-on product called Ingres/Star. This optional software supports distributed query optimization, the ability to read and update records at multiple sites in the same transaction, and the capability to delete records at multiple sites.

Informix's On-Line is designed principally for Unix environments but also runs under Novell, Inc.'s NetWare. On-Line has a query optimizer and many of the same distributed functions as Ingres' product, but it takes up a large amount of system resources, such as memory.

Oracle promises to deliver a wealth of distributed features in Oracle 7, including a distributed query optimizer and the ability to read and update records at multiple sites in a single transaction. Oracle says it is delivering Oracle 7 for seven operating systems now. It promises to roll out versions for close to 80 additional operating systems by early next year.

Oracle 7 will support a broad mix of network protocols and gateways to other vendors' databases, such as IBM's DB2 and SQL/DS, as well as Tandem Computers, Inc.'s NonStop SQL, DEC's Rdb and HP's TurboImage. Oracle is developing gateways to 18 other DBMSs, as well.

Sybase promises to provide its System 10 on a variety of Unix-based platforms, as well as OS/2, Windows NT and NetWare. System 10 will run across a rich mix of networks and support gateways to IBM's DB2, Oracle 7, Informix's On-Line and DEC's Rdb. Distributed functionality, including a query optimizer and the ability to read and update data at multiple sites, is supported via an add-on product called Replication Server.

Each of the four vendors supports a site autonomy feature that enables each database in the distributed environment to be managed locally.

Each also supports the ANSI SQL-89 standard, which provides a common query language, as well as a set of proprietary extentions to SQL-89. Oracle also offers its proprietary Procedural Language/SQL, while Sybase provides its proprietary Transact-SQL.

In addition, each vendor supports transparency features that enable end users to query, update and view data at multiple sites transparently.

While all of the offerings provide access to other vendors' DBMSs, data from those disparate DBMSs cannot be involved in a distributed update due to incompatibilities among two-phase commit protocol implementations.

Each package also supports local and global database locking but at different levels. Locking prevents users from changing data that has been checked out by other users.

Some vendors lock entire files, data tables or pages of data, while others lock only tables or rows of data.

Each vendor also intends to support IBM's Distributed Relational Database Architecture. While IBM has laid out its plans for providing a distributed DBMS, it has yet to release products that provide for distributed DBMS functionality (see "IBM slow to deliver distributed DBMS," page 60).

Distributing data

While the operating systems and network transport protocols distributed DBMSs support are key in determining the type of environment they are suited for, the data distribution functions they support largely determines how the products can be used.

The defining characteristic of a distributed DBMS is its ability to move data from a single node to many nodes.

Fragmentation can be used to split up and distribute tables. Alternatively, tables themselves can be fragmentated and distributed.

Another data distribution method is to replicate the database — or more likely, portions of it — and distribute the copies among nodes.

McGoveran notes that both fragmentation and replication allow data to be stored at the node where it is most likely to be used. This decreases network transmission costs and minimizes the use of distant CPU cycles and other resources. "I only want to have to ship data over the [wide area] network on an exception basis," he says.

Today, none of the four vendors offers ready-to-roll fragmentation. However, McGoveran says programmers can write software routines that mimic fragmentation in all four vendors' products.

(continued on page 60)

The baker's dozen of key features

Users interested in obtaining a distributed database management system should ask vendors about their support for a baker's dozen of key features that many experts say are required of a product earning the distributed DBMS label.

According to David McGoveran, president of Alternative Technologies, a Boulder Creek, Calif.-based relational database consultancy, this list of characteristics provides a description of the features a distributed DBMS should be able to support.

■ **Distributed data dictionary/directory.** This feature tracks what type of data is stored and where, as well as how it can be accessed.

■ **Transparent two-phase commit.** This protocol ensures data consistency. When a transaction involves more than one node, two-phase commit allows the transaction to be completed only if every node has done the tasks it is required to perform. If any node cannot perform a task, the entire transaction aborts.

■ **Horizontal and vertical fragmentation.** This element enables users to split a database table into rows (horizontal) or columns (vertical) and move them among nodes.

■ **Replication independence.** With this feature, users should be able to replicate data at another node without affecting application performance or database consistency.

■ **Multiple-site views.** With this feature, users can join data tables on one node with tables on others.

■ **Distributed query optimization.** This feature figures out the best methods of executing complicated functions — such as joining tables — over complex wide-area nets. Among other things, it identifies the network link capable of handling the amount of information being transferred and determines which node has enough processing power to join tables.

■ **Multisite integrity constraints.** This feature maintains referential integrity of data so that tables on distant nodes that are dependent on a master database record are automatically updated when the master record is updated.

■ **Local autonomy.** With this element, database administrators retain control over the data stored at their site.

■ **Continual operation.** This is a way to ensure that processing at a local site is not interrupted by activity at other sites.

■ **Location independence.** This feature enables data to be moved from one site to another without affecting application processing.

■ **Distributed transaction management.** This feature enables recovery of a database spanning multiple nodes in compliance with any existing integrity constraints.

■ **Global concurrency and deadlock recovery.** This manages locks on data records across a distributed database. It also detects and resolves any conditions where two nodes may be deadlocked in their efforts to access each other's data.

■ **Hardware, software, network and third-party DBMS independence via built-in support or gateways.** These elements fit the distributed DBMS into existing environments and data systems.

— *Kyle Nitzsche*

NETWORK
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Inoculating the LAN

By ALISON CONLIFFE

Like President-elect Bill Clinton, who is guarded by the Secret Service from attacks, the servers that function as the executive branch of today's departmental LANs need protection. For administrators trying to secure local-area networks against the threat of viruses, outfitting workstations on the perimeter of a network with antivirus software sometimes isn't enough.

Fortunately for users, a new class of products is emerging that protect nets by scanning for viruses in all files moving in or out of the server. As part of *Network World's* Network Security Test Series, the International Computer Security Association (ICSA) evaluated Version 1 of Cheyenne Software, Inc.'s InocuLAN, which was the second server-based product to emerge for protecting Novell, Inc. NetWare LANs.

> The test showed InocuLAN to be a solid product for protecting LANs from viruses.
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The first product to appear was Intel Corp.'s LANProtect, which the ICSA evaluated in June ("Intel launches virus counterattack," *NW,* Aug. 31). Like LANProtect, InocuLAN offers real-time protection of NetWare servers through a NetWare Loadable Module (NLM) for NetWare 3.11 environments. The product costs $495 for up to 20 users or $995 for as many as 250 users.

Unlike Intel, with its LANProtect Version 1.0, Cheyenne offers a version of InocuLAN that runs as a value-added process (VAP) for NetWare 2.X LANs. The VAP version, which wasn't included in the ICSA's tests, costs $395.

LANProtect includes a standalone scanner for workstations. InocuLAN contains not only a workstation scanner, but also other workstation components, such as terminate-and-stay-resident (TSR) programs, that offer real-time protection of both server and workstations.

Licensing for InocuLAN's personal computer components is included free with the VAP or the NLM version.

The ICSA's test showed InocuLAN to be a solid product for protecting LANs from virus invasion. And, according to the ICSA, it offers some important features not found in other products.

InocuLAN's NLM component was able to detect 828, or about 60%, of the ICSA's collection of 1,374 file viruses, a score the ICSA finds good. Considering the large number of new viruses being written daily, users can look at a score of 40% as good on such a large collection. Tests of InocuLAN's workstation scanner showed it detected the 10 most common viruses and was successful in removing all but one.

InocuLAN also provides a quick and easy way to upgrade the workstation components and a superior method for notifying LAN managers of infected files. Finally, the product can be tuned so it doesn't take a toll on server performance.

InocuLAN's components

In addition to the NLM or VAP, InocuLAN includes the standalone scanner that runs on either the server or LAN-attached workstations, several workstation-based TSR programs, and utilities that make the chore of finding and rooting out viruses easier. See the graphic on page 48 for a description of components and system requirements.

The NLM provides unattended real-time file scanning. The product constantly monitors activity between clients and the server, checking all files that pass between them and automatically preventing users from accessing infected files.

InocuLAN's VAP for NetWare 2.X checks a list of the 64 most frequently accessed, or hot files, for virus activity. Because it does not offer unattended real-time scanning of all files, the VAP does not provide the same level of protection as the NLM.

> InocuLAN's features and solid performance make life easier for LAN managers.

The ICSA included InocuLAN's workstation scanner, called INOCULAN.EXE, in its evaluation, as well as one of its TSR programs, called IMM-ALL. IMM-ALL checks workstations for viruses both on disk and in random-access memory. Because these components protect the workstations, or perimeter, of the LAN, as opposed to the server, they give LAN managers an added level of security.

InocuLAN also contains a software module called Examine, which runs on the workstation and backs up uninfected master boot records, boot records and system files onto a floppy disk. Examine enables workstation users to restore those files from the floppy if the original files become infected or corrupted.

This capability sets InocuLAN apart from most other products. LANProtect, for example, does not include any facility for backing up master boot records.

Finally, the package contains another software module, called AVUpdate, which is an automatic software distribution utility that sends revised versions of the workstation scanner and TSRs to workstations when they log on. Once AVUpdate is in the system logon script, InocuLAN upgrades are automatically distributed.

Currently, few other products have a feature comparable to InocuLAN's AVUpdate, but according to David Stang, director of research for the ICSA, users will see more of this approach in the future with all server applications, not just antivirus software.

"That is probably the single biggest wave of the future," Stang says. "Network managers are tired of running around upgrading software on workstations. One day we'll see this automatic update feature with word processing and spreadsheets."

NLM virus detection

Among the tests it conducted, the ICSA examined the InocuLAN NLM's ability to detect and prevent an infected file from being copied from the workstation to the server. Viruses used in the test included Cascade.1701, Cascade.1704, Dark Avenger.1, Dark Avenger.4, Frodo, Green Caterpillar.1, Jerusalem.Standard and Yankee Doodle 2885. The ICSA attempted to copy one .COM file and one .EXE file infected with each virus.

The NLM detected and prevented copying of all files except the .EXE file containing Dark Avenger.4. With each file it caught, the product sent a 25th line message — which appears on the typically unused 25th line of a PC screen — saying "Warning — This file is infected with a virus."

Next, the ICSA tested the NLM to see if it would detect a virus in an infected file being accessed on the server. The NLM prevented a workstation from calling any file that InocuLAN identified as containing a virus. Attempts to call the files produced the message "Cannot execute XXX," where XXX specifies the drive, path and full file name.

> InocuLAN can be tuned so it doesn't take a toll on server performance.
>
> ▲▲▲

The ICSA then turned its efforts to discovering what percentage of its huge collection of file viruses the InocuLAN NLM detects. Of 1,374 tested viruses, InocuLAN identified and prevented the copying of 828 of those, or about 60%.

"With the rate at which new viruses are being written today, any virus scanner will miss 400 or so," Stang says. "We think that detecting 828 viruses from this collection is quite good."

For this test, the ICSA used a virus collection culled from virus researchers Fridrik Skulason and Alan Solomon. The two collections contain only real, replicating viruses and represent a high percentage of the file viruses written for MS-DOS machines.

The ICSA attempted to copy this collection to the server without running any TSRs at the workstation. LAN managers can set up InocuLAN to delete the infected file, rename it so it is no longer executable or move it to a protected location.

For this test, the ICSA set up the InocuLAN NLM to delete files containing viruses. The product warned the designated users, including the LAN manager, of the 828 infected files it detected, deleted them and wrote appropriate information to a log file.

Workstation scanner tests

Finally, the ICSA tested the workstation scanner, INOCULAN.EXE, to determine if it could detect a master boot sector or boot sector virus on a user's C drive. ICSA staffers found that INOCULAN.EXE detected boot sector viruses on the C drive.

Like LANProtect Version 1.0, the NLM does not check for boot viruses or file viruses on the

(continued on page 48)

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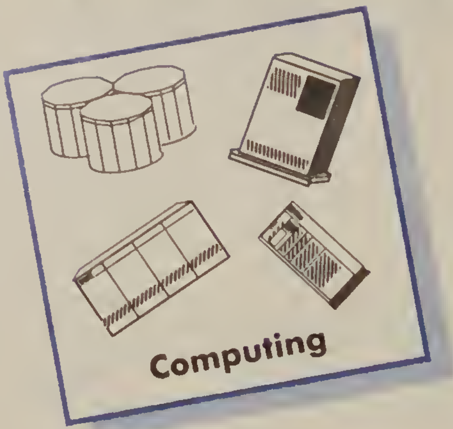

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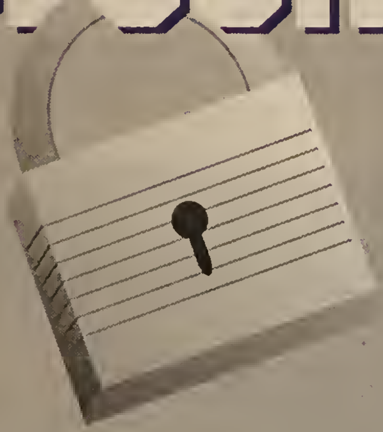

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(continued from page 45)

workstation drives. Thus, if the user unwittingly loads a disk infected with Michelangelo in the A drive and accesses it with only the NLM running, the user will not automatically be notified of the virus's presence.

However, if the NLM is running, the InocuLAN scanner and TSRs that run on the workstation will notify both workstation users and LAN managers when they find an infected file.

> "The 10 most common viruses account for maybe 90% or 95% of all infections."
>
> ▲▲▲

For example, if the InocuLAN TSR component IMM-ALL is installed in memory and the NLM is running on the server, the workstation user gets the message, "The Michelangelo virus was found and was removed from memory!" If the workstation user accesses the drive, the product sends a 25th line message saying "Warning — This disk is infected with a virus. Press <Ctrl><Enter> to continue."

In addition, the NLM sends a message to the LAN manager's system console saying "Boot Virus Detected — (user name) at (user address)."

The ICSA also tested INOCULAN.EXE to see how many of the 10 most common viruses it could detect. The workstation component detected all of the ICSA's 10 most common viruses ("The top viruses," *NW*, July 27).

"The 10 most common viruses account for maybe 90% or 95% of all infections, so it's very important [that products be able to detect those]," Stang says. "Probably very close to 100% of all infections are from the 40 most common [viruses]. If you can detect the most common ones, you'll be pretty safe."

Besides detection, scanners should also be able to remove enough of the virus so that a subsequent scanner cannot detect the virus in the file. Any program that leaves the infected file smaller than it was before infection has damaged the file and shouldn't be credited with having removed it.

InocuLAN successfully removed nine of the 10 viruses. The only one the product could not remove was Dark Avenger.4 — also known as Eddie II, V2100 and 2100 — which adds 2,100 bytes to .COM and .EXE files.

When it encounters this virus, the product sends the user the message "Cannot cure virus [virus name] in this version. File [name] will be renamed to [new name]. Please contact Cheyenne Software, Inc. at 1-800- CHEY-INC."

Detecting all 10 viruses and removing nine of them gives InocuLAN a good virus removal record. According to Stang, almost all antivirus products on the market today can detect the most common viruses, but not as many can remove them all. When tested, LANProtect's workstation scanner (Version 1.0), for example, could detect all 10 but couldn't remove any of them.

The ICSA also tested INOCULAN.EXE to see what percentage of its collection of 1,374 file viruses it could detect. The workstation scanner detected 824, for a detection rate of about 60%.

Like most stand-alone workstation scanners, INOCULAN.EXE can be installed on a LAN server and scan LAN-attached workstations from there. For this test, the ICSA scanned a hard disk on the workstation from the server and deleted all viruses detected. The product was set up to use the advanced, or thorough, option, and it scanned all file types. A similar test of the TSR IMM-ALL showed that it detected 874 viruses, giving it a detection rate of about 64%.

Based on its results, the ICSA considers InocuLAN to be a solid performer.

Bells and whistles

InocuLAN has several features that boost its appeal. LAN managers can control how often and when the product scans and how the scanner will notify the manager when it detects a virus.

> Detecting all 10 viruses and removing nine of them gives InocuLAN a good virus removal record.
>
> ▲▲▲

For example, it can notify LAN managers of detected viruses automatically via radio pagers, the NetWare Message Handling Service (MHS), an activity log file or 25th line messages. LAN managers can decide which methods should be used.

According to the ICSA, InocuLAN's notification abilities set it apart from others on the market. For example, while LANProtect is quite good at detecting viruses, Version 1.0 does not send messages to supervisors when viruses are detected.

InocuLAN's notification abilities show "how terrific the product is," Stang says. "They've really thought through how the product would be used."

Because it notifies LAN managers immediately when viruses are found, InocuLAN's notification obviates the need for LAN managers to constantly check a summary report or log. "They have reduced the labor-intensiveness of monitoring for viruses and the annoyances of the virus problem substantially," he says.

LAN managers can control the impact the product has on server CPU utilization, which also sets it apart from similar products. According to Stang, if the server is overtaxed when the product is set up for continuous scanning, LAN managers can adjust it to scan only at preset intervals.

InocuLAN has another feature called enforcement, which prevents workstation users from turning off InocuLAN's workstation components.

"This feature in all server applications would be a big plus for LAN managers," Stang says. "Imagine if they could say to end users that you can't log on to the network unless you have your system set up in a certain configuration."

> According to the ICSA, InocuLAN's notification abilities set it apart from others.
>
> ▲▲▲

According to Stang, such capabilities would let LAN managers enforce corporate standards from a distance, without having to appear as "network bullies."

One of the product's greatest advantages is its ease of installation. ICSA staffers installed the product on the server in less than a minute by simply typing INSTALL at the A: prompt.

Because of its enforcement and notification abilities, as well as its easy upgrade method, the ICSA considers InocuLAN one of the most sophisticated and feature-rich products available.

> LAN managers can control the impact the product has on server CPU utilization.
>
> ▲▲▲

InocuLAN, with its NLM and VAP approach, is a great improvement over most scanners on the market today, which protect only stand-alone or LAN-attached workstations. InocuLAN's real-time monitoring allows scanning to be done automatically on a file just before it is executed, unlike traditional scanners that require user interaction.

With InocuLAN, the real-time monitor acts immediately, either deleting, renaming or moving infected files copied to the server, thus preventing the spread of the virus. With traditional scanners, a virus can infect the system in the time between intermittent scans and escape detection until the next scan is done.

Once memory-resident, some viruses can escape detection. But with InocuLAN's real-time monitoring, users can't run infected programs. InocuLAN, thus, prevents stealth viruses from becoming memory-resident and escaping detection. With InocuLAN, network users are guaranteed that a file infected with a virus that InocuLAN can detect will never be used.

If the server has no protection of its own, it must rely on workstations to protect it, which is not always optimal. InocuLAN does a good job protecting the server from viruses that might attack it from any source — including workstations — and protecting workstations from viruses that might infect them from any source — including the server and local drives. ◼

What's in the box?

Cheyenne Software, Inc.'s InocuLAN

Component	Description	Requirements
InocuLAN NLM	NetWare Loadable Module provides menu-driven real-time scanning of files going into or out of the server.	Novell, Inc. NetWare 3.11, 500K bytes of RAM, Hayes-Microcomputer Products, Inc. compatible modem for optional pager
InocuLAN VAP	Value-added process provides command-line driven scanning of 64 hot files established by LAN manager.	NetWare 2.1 or higher, 30K bytes of RAM, Hayes-compatible modem for optional pager
INOCULAN.EXE	Stand-alone workstation scanner scans workstation files for viruses.	Less than 350K bytes of storage space on server
Prevent	TSR program monitors workstations and checks for virus-like behavior.	20K of RAM, DOS 3.0 or higher, compatible with Microsoft Corp.'s MS-Windows, may be loaded into high memory
IMM-ALL	TSR program scans files on workstation as they are executed, accessed or opened.	19.5K bytes of RAM when using network features, 17.5K bytes of RAM when used in stand-alone mode, DOS 3.0 or higher, compatible with MS-Windows, may be loaded into high memory
IMM-WILD	TSR program scans files on workstation as they are executed, accessed or opened.	11.6K bytes of RAM when using network features, 9.6K bytes of RAM when used in stand-alone mode, DOS 3.0 or higher, compatible with MS-Windows, may be loaded into high memory
Examine	Utility program protects system area of workstation by backing up master boot record, boot record and system files of hard disk onto floppy.	Any PC with 64K bytes of RAM, DOS 3.0 or higher
AVUpdate	Utility ensures workstations have latest version of program installed.	No special requirements

SOURCE: INTERNATIONAL COMPUTER SECURITY ASSOCIATION, WASHINGTON, D.C.

Conliffe is an associates features editor at Network World.

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
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65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
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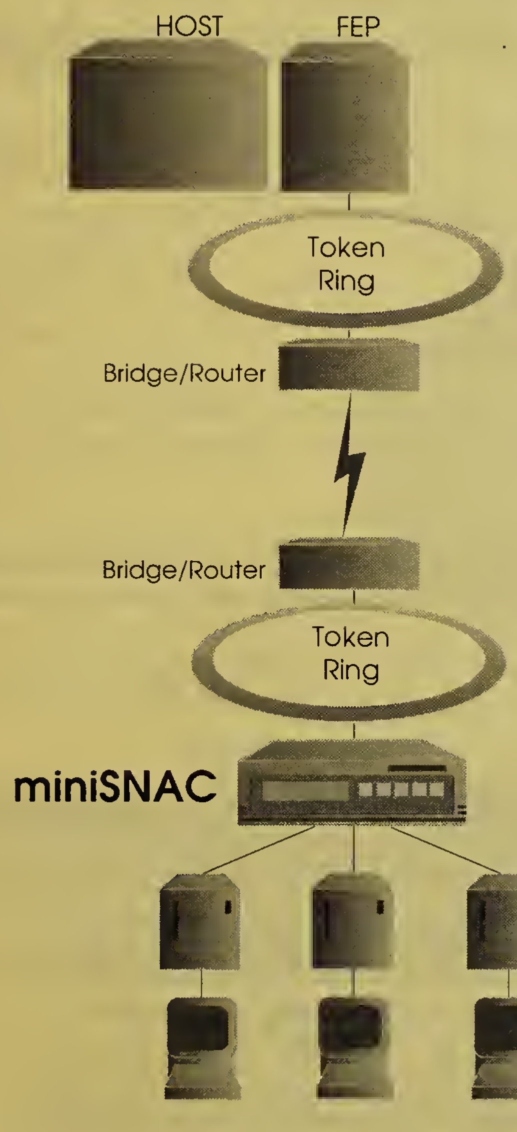
97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112
113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128

ACCESS CONTROLLERS

Don't burden the router



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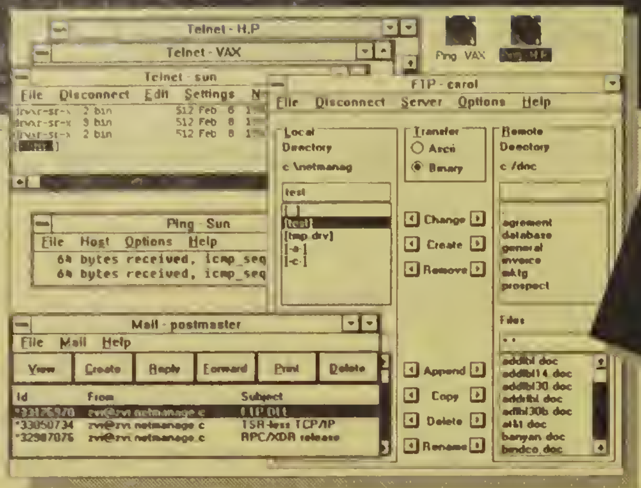

```
drwxr-sr-x  2 bin      512 Feb  6
drwxr-sr-x  3 bin      512 Feb  8
drwxr-sr-x  2 bin      512 Feb  8
```

```
64 bytes received, icmp_seq
64 bytes received, icmp_seq
```

```
Id          From                    Subject
*33175970   zvi@zvi.netmanage.c     FTP DLL
*33050734   zvi@zvi.netmanage.c     TSR-less TCP/IP
*32987076   zvi@zvi.netmanage.c     RPC/XDR release
```

test
[..]
[test]
[tmp drv]
[-a-]
[-c-]

agreement
database
general
invoice
mktg
prospect

addlbl doc
addlbl14 doc
addlbl30 doc
addrlbl doc
adlbl30b doc
at&t doc
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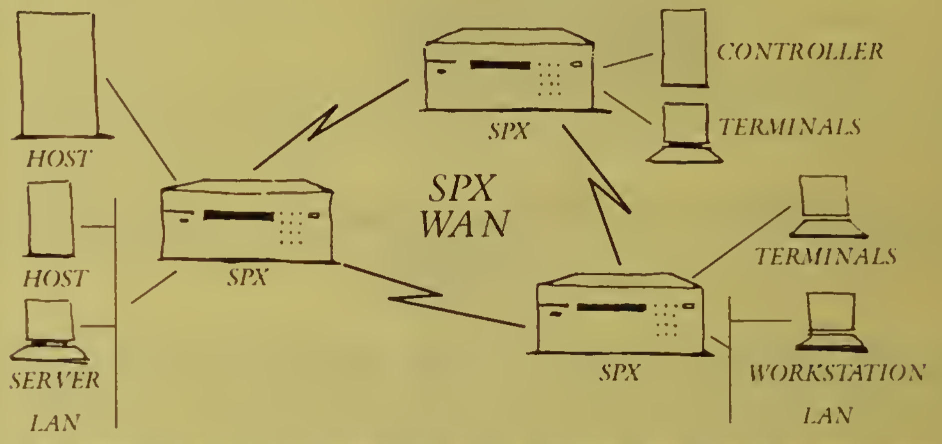

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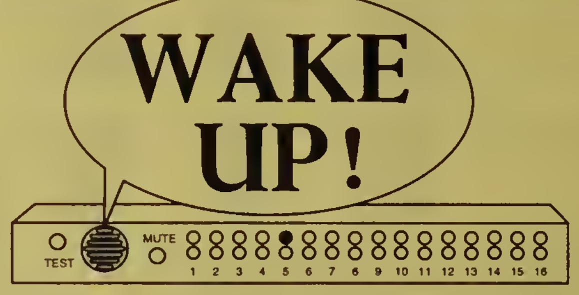

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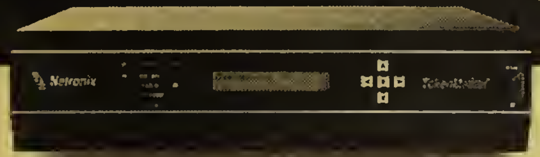

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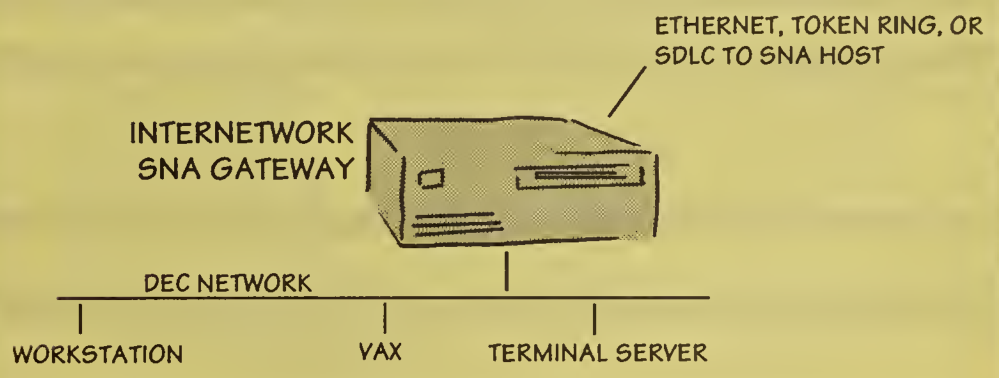

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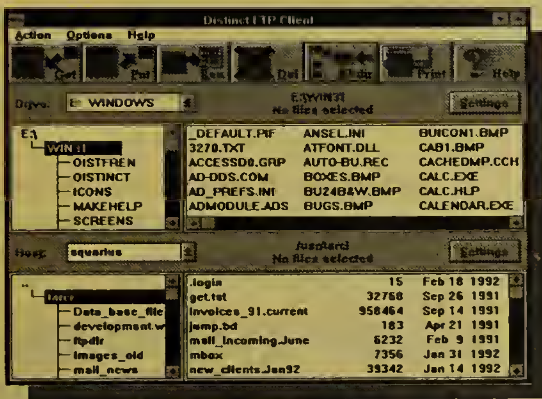

```
Drive: E: WINDOWS        E:\WIN31
                         No files selected
E:\
 └WIN31          _DEFAULT.PIF   ANSEL.INI      BUICON1.BMP
   ├OISTFREN     3270.TXT       ATFONT.DLL     CAB1.BMP
   ├OISTINCT     ACCESSD0.GRP   AUTO-BU.REC    CACHEDMP.CCH
   ├ICONS        AD-DDS.COM     BOXES.BMP      CALC.EXE
   ├MAKEHELP     AD_PREFS.INI   BU24B&W.BMP    CALC.HLP
   ├SCREENS      ADMODULE.ADS   BUGS.BMP       CALENDAR.EXE

Host: squarius           /usr/tarci
                         No files selected
..
 └tarci          .login                    15  Feb 18 1992
   ├Data_base_file get.txt               32768  Sep 26 1991
   ├development.w invoices_91.current  958464  Sep 14 1991
   ├ftpdir       jump.txt                 183  Apr 21 1991
   ├images_old   mail_incoming.June      6232  Feb  9 1991
   ├mail_news    mbox                    7356  Jan 31 1992
                 new_clients.Jan92      39342  Jan 14 1992
```

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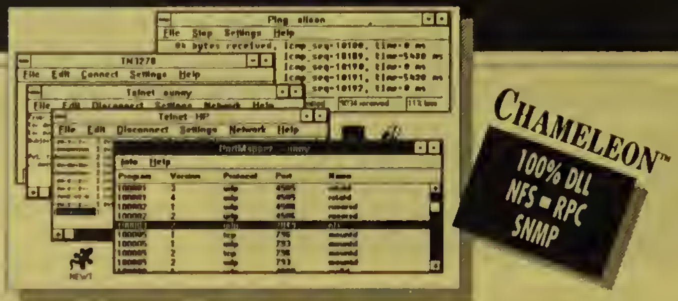
Ping alison
File Stop Settings Help
TN1270
File Edit Connect Settings Help
Telnet sunny
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Program Version Protocol Port Name
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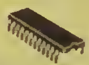

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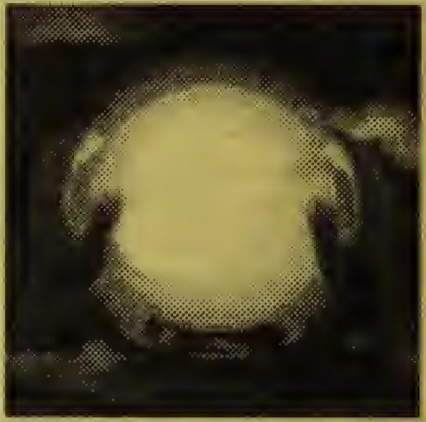

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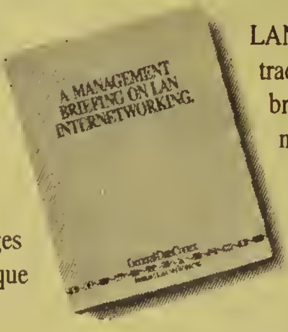

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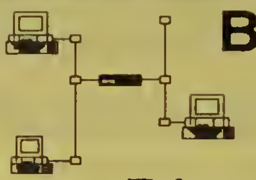
LAN/WAN INTERNETWORKING



Bridge The Gaps
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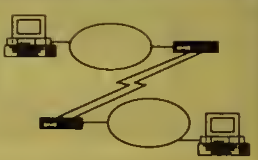

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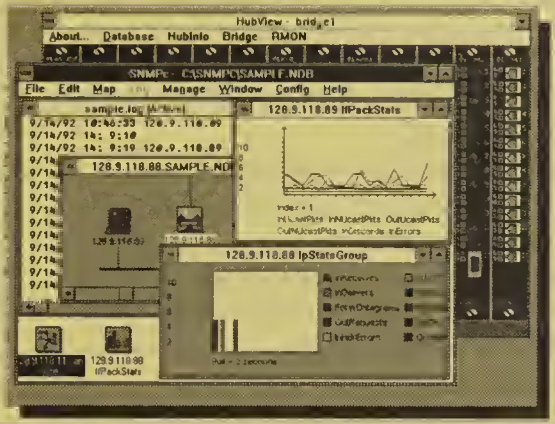
HubView - brid_e1
About... Database HubInfo Bridge RMON
SNMPc - C:\SNMPC\SAMPLE.NDB
File Edit Map Manage Window Config Help
sample.log
128.9.118.89 ifPackStats
128.9.118.88 SAMPLE.NDB
128.9.118.88 IpStatsGroup
Index = 1
128.9.118.88 ifPackStats

```
9/14/92 10:46:33 128.9.118.89
9/14/92 14: 9:10
9/14/92 14: 9:19 128.9.118.89
```

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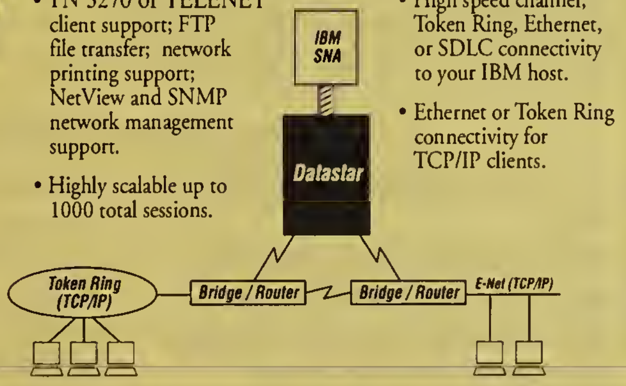

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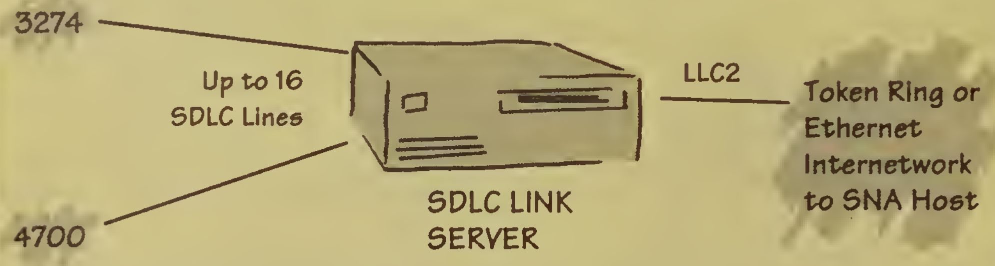

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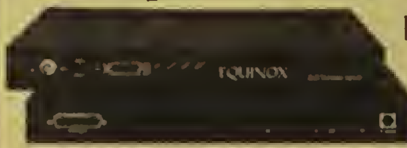

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By Paul Longoria

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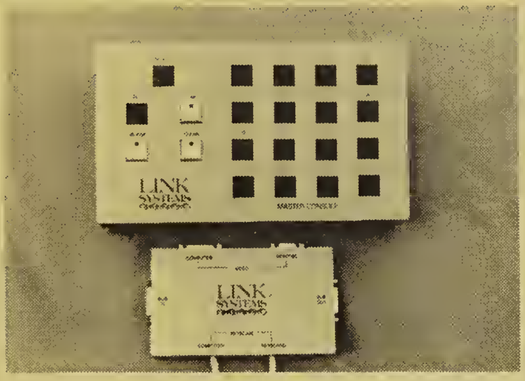

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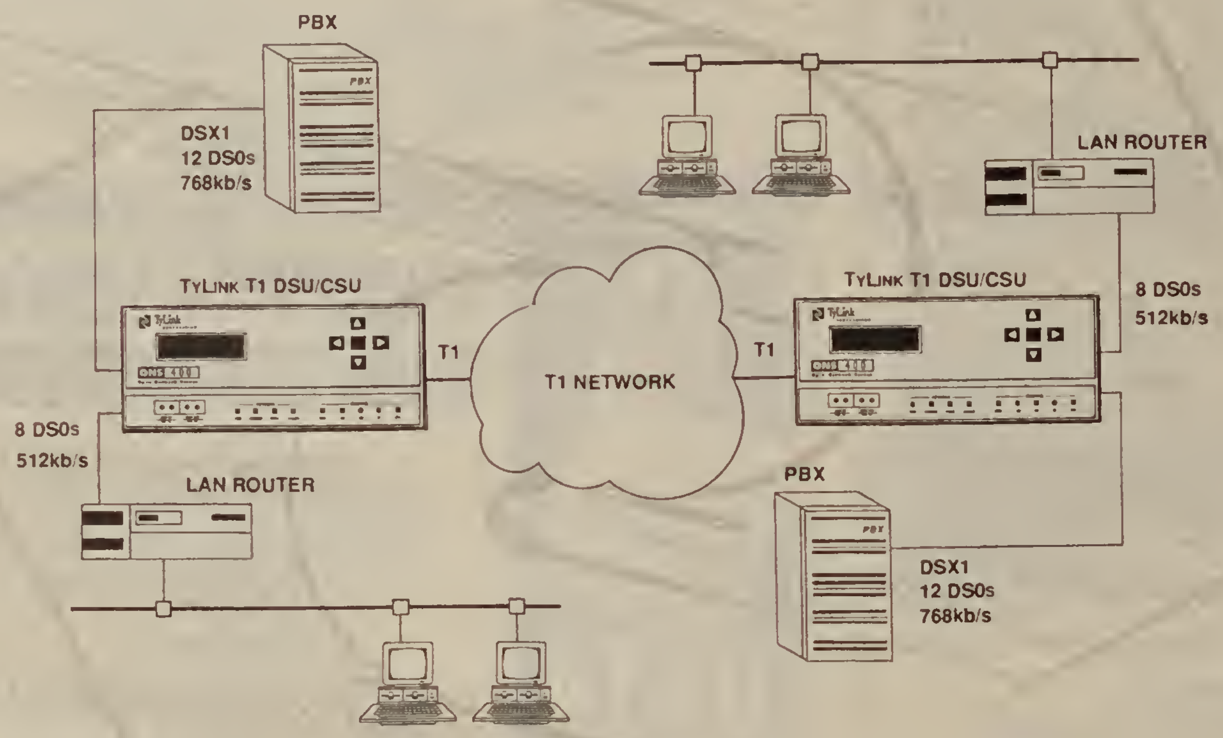

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1 Industry: (check one only)

01. ☐ Manufacturers (other than Computer/Communications)
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03. ☐ Insurance
04. ☐ Real Estate
05. ☐ Healthcare Services
06. ☐ Legal
07. ☐ Hospitality
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09. ☐ Transportation
10. ☐ Utilities
11. ☐ Education
12. ☐ Process Industries (Mining/Construction/ Petroleum Refining/Agriculture/Forestry)
13. ☐ Government, State/Local
14. ☐ Government, Federal
15. ☐ Military
16. ☐ Aerospace
17. ☐ Consultants (Independent)
18. ☐ Carriers
19. ☐ Interconnects
20. ☐ Manufacturers (Computer/Communications)
21. ☐ VAR/VAD/VAN/ Systems Houses
22. ☐ Distributors, Computer Related
23. ☐ Distributors, Communications Related
24. ☐ Other_______________________

2 What is your job function? (check one only)

NETWORKING MANAGEMENT
1. ☐ Networking Mgmt. 3. ☐ Datacom/Telecom Mgmt.
2. ☐ LAN Mgmt. 4. ☐ Engineering Mgmt.

MIS MANAGEMENT
5. ☐ MIS, IS, IT Mgmt. 6. ☐ Engineering Mgmt.

CORPORATE MANAGEMENT
7. ☐ Corporate Mgmt. (CIO, CEO, Pres., VP, Dir., Mgr., Financial Mgmt.)

8. ☐ Consultant (Independent)

9. ☐ Other_______________________

3 My responsibilities include: (check one only)

1. ☐ LANs/ Internetworking/ WANs 3. ☐ LANs 5. ☐ None
2. ☐ LANs/ Internetworking 4. ☐ WANs

4 What is the total number of sites for which you have purchase influence? (check one only)

1. ☐ 100+ 3. ☐ 20 - 49 5. ☐ 2 - 9. 7. ☐ None
2. ☐ 50 - 99 4. ☐ 10 - 19 6. ☐ 1

5 What is your scope and involvement in purchasing decisions for network products & services for your enterprise?

A. Scope (check one only)
1. ☐ Corporatewide
2. ☐ Multienterprise (consultants)
3. ☐ Departmental

B. Involvement (check all that apply)
1. ☐ Recommend/Specify
2. ☐ Approve
3. ☐ Evaluate

4. ☐ None (A or B)

6 Check all that apply in Columns A and B:

A: I am involved in the purchase of the following products/services.
B: I plan to purchase the following products/services in the next year.

Involved / Plan to Purchase

A B **LOCAL-AREA NETWORKS**
☐ 01. ☐ Local-Area Networks
☐ 02. ☐ LAN Servers
☐ 03. ☐ LAN Operating Systems Software
☐ 04. ☐ Superservers
☐ 05. ☐ Data Base Servers (Oracle, Sybase, etc).
☐ 06. ☐ Terminal Servers
☐ 07. ☐ LAN Services
☐ 08. ☐ LAN Storage Devices (optical, tape, disk, etc,. including backup systems)
☐ 09. ☐ Network Test Equipment
☐ 10. ☐ Hubs
☐ 11. ☐ Cables, Connectors, Baluns
☐ 12. ☐ UPS
☐ 13. ☐ Network Adapter Boards
☐ 14. ☐ Peer-to-Peer LANs
☐ 15. ☐ Wireless LANs
☐ 16. ☐ SNMP Network Management
☐ 17. ☐ ATM (Asynchronous Transfer Mode)

A B **INTERNETWORKING**
☐ 18. ☐ Bridges
☐ 19. ☐ Routers
☐ 20. ☐ Gateways
☐ 21. ☐ Bridge/Routers
☐ 22. ☐ Hubs
☐ 23. ☐ Intelligent Hubs
☐ 24. ☐ Communications Servers

Involved / Plan to Purchase

A B **COMPUTERS/PERIPHERALS**
☐ 25. ☐ Micros/PCs
☐ 26. ☐ Minis
☐ 27. ☐ Mainframes
☐ 28. ☐ Pen-Based
☐ 29. ☐ Laptops
☐ 30. ☐ Workstations
☐ 31. ☐ Image Processing Workstations
☐ 32. ☐ Front-End Processors
☐ 33. ☐ Terminals
☐ 34. ☐ Printers
☐ 35. ☐ Cluster Controllers
☐ 36. ☐ Fax Machines
☐ 37. ☐ X-Terminals

A B **SOFTWARE/APPLICATIONS**
☐ 38. ☐ Network Management
☐ 39. ☐ Micro to Mainframe
☐ 40. ☐ Security
☐ 41. ☐ Communication/Terminal Emulation
☐ 42. ☐ Word Processing
☐ 43. ☐ Operating Systems
☐ 44. ☐ Business Applications (Finance/Mfg/HR)
☐ 45. ☐ Applications Development
☐ 46. ☐ Data Base Management
☐ 47. ☐ Spreadsheet
☐ 48. ☐ Groupware
☐ 49. ☐ EDI
☐ 50. ☐ E-Mail
☐ 51. ☐ Windows/Graphical User Interface
☐ 52. ☐ 4GL/Development
☐ 53. ☐ Multimedia
☐ 54. ☐ Graphics
☐ 55. ☐ Utilities

A B **WIDE-AREA NETWORK EQUIPMENT/SERVICES**
☐ 56. ☐ Modems (9.6K bps and over)
☐ 57. ☐ Modems (under 9.6K bps)
☐ 58. ☐ T-1
☐ 59. ☐ T-3
☐ 60. ☐ Fractional T-1
☐ 61. ☐ Data Switches
☐ 62. ☐ SMDS
☐ 63. ☐ ATM (Asynchronous Transfer Mode)
☐ 64. ☐ Matrix Switches
☐ 65. ☐ Packet Switches
☐ 66. ☐ Protocol Converters
☐ 67. ☐ Diagnostic/Test Equipment
☐ 68. ☐ DSU/CSUs
☐ 69. ☐ Microwave
☐ 70. ☐ Fax Boards/Modems
☐ 71. ☐ VSAT
☐ 72. ☐ Fiber Optic
☐ 73. ☐ Satellite
☐ 74. ☐ ISDN
☐ 75. ☐ PBXs (over 1000 lines)
☐ 76. ☐ PBXs (under 1000 lines)
☐ 77. ☐ Automatic Call Distributors
☐ 78. ☐ Voice Messaging Systems
☐ 79. ☐ Videoconferencing Systems
☐ 80. ☐ Voice Response/Processing
☐ 81. ☐ Switched Voice
☐ 82. ☐ Dedicated Leased Line
☐ 83. ☐ Switched Data
☐ 84. ☐ Centrex
☐ 85. ☐ E-Mail/On-Line Information
☐ 86. ☐ Image Processing
☐ 87. ☐ Audio Teleconferencing
☐ 88. ☐ Local Services
☐ 89. ☐ WATS MTs
☐ 90. ☐ International
☐ 91. ☐ Virtual Networks
☐ 92. ☐ Frame Relay
☐ 93. ☐ Value Added Services
☐ XX ☐ None of the above (1-93)

7 What is the total number of A: LANs B: Workstations/Nodes in your entire organization?

	LANs A		Workstations/ Nodes B
1.	☐	5,000+	☐
2.	☐	1,000 - 4,999	☐
3.	☐	100 - 999	☐
4.	☐	50 - 99	☐
5.	☐	10 - 49	☐
6.	☐	9 or Less	☐

8 Which of the following network platforms are currently installed/planned in the next year?

NETWORK ARCHITECTURES
Present Planned
☐ 01. ☐ SNA
☐ 02. ☐ DECNET
☐ 03. ☐ MAP/TOP
☐ 04. ☐ TCP/IP
☐ 05. ☐ DCA (Unisys)
☐ 06. ☐ X.25

Present Planned
☐ 07. ☐ NOVELL IPX/SPX
☐ 08. ☐ APPC/APPN/LU 6.2
☐ 09. ☐ NETBIOS
☐ 10. ☐ OSI
☐ 11. ☐ APPLETALK
☐ 12. ☐ OTHER_______________

LAN OPERATING SYSTEM
☐ 13. ☐ LOCALTALK (APPLETALK)
☐ 14. ☐ BANYAN (VINES)
☐ 15. ☐ DCA (IRMALAN)
☐ 16. ☐ DCA (10-NET)
☐ 17. ☐ IBM (LAN SERVER)
☐ 18. ☐ IBM (PC LAN PROGRAM)
☐ 19. ☐ MICROSOFT (LAN MANAGER)
☐ 20. ☐ UNGERMANN-BASS (NET/1)
☐ 21. ☐ NOVELL (NETWARE, 2.X, 3.X, 4.X)
☐ 22. ☐ PROTEON (PRONET)
☐ 23. ☐ SITKA (TOPS)
☐ 24. ☐ 3COM (3+, 3+OPEN)
☐ 25. ☐ ARTISOFT (LANTASTIC)
☐ 26. ☐ HAYES (LANSTEP)
☐ 27. ☐ DEC (PATHWORKS)
☐ 28. ☐ OTHER_______________

LAN ENVIRONMENT
☐ 29. ☐ 4M TOKEN RING
☐ 30. ☐ 16M TOKEN RING
☐ 31. ☐ ARCNET
☐ 32. ☐ ETHERNET
☐ 33. ☐ STARLAN
☐ 34. ☐ FDDI
☐ 35. ☐ LOCALTALK
☐ 36. ☐ 10BASE-T
☐ 37. ☐ OTHER_______________

OPERATING SYSTEM
☐ 38. ☐ DOS
☐ 39. ☐ UNIX/XENIX/AIX
☐ 40. ☐ OS/2
☐ 41. ☐ OS/2 2.X
☐ 42. ☐ MVS
☐ 43. ☐ VM
☐ 44. ☐ VMS
☐ 45. ☐ MACINTOSH
☐ 46. ☐ WINDOWS
N/A 47. ☐ WINDOWS NT
☐ 48. ☐ X WINDOWS
☐ 49. ☐ OTHER_______________

9 For which areas outside of the U.S. do you have purchase influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East
6. ☐ None

10 Which of the following hardware platforms is installed/planned in your company? (check all that apply)

	Mainframes Currently Installed	Planned Next Year	Minis Currently Installed	Planned Next Year
01. DEC	☐	☐	☐	☐
02. IBM	☐	☐	☐	☐
03. AMDAHL	☐	☐	☐	☐
04. AT&T	☐	☐	☐	☐
05. BULL HNIS	☐	☐	☐	☐
06. DATA GENERAL	☐	☐	☐	☐
07. HP	☐	☐	☐	☐
08. TANDEM	☐	☐	☐	☐
09. UNISYS	☐	☐	☐	☐
10. OTHER_______________	☐	☐	☐	☐

MICROCOMPUTERS
(fill in the numbers)

	NUMBER INSTALLED	NUMBER PLANNED NEXT YEAR
11. MACINTOSH 20, 30, 40		
12. MACINTOSH OTHER		
13. PCs BASED ON 80586	N/A	
14. PCs BASED ON 80486		
15. PCs BASED ON 80386		
16. PCs BASED ON 80286		
17. PCs BASED ON 8086/8088		
18. RISC / UNIX BASED WKSTNS		
19. OTHER		

11 Estimated value of networking equipment and services:

A. Which you helped specify, recommended or approved in the last year?
B. Which you plan to help specify, recommend or approve in the next year?

A B
☐ 1. ☐ $100 million and over
☐ 2. ☐ $50 - $99.9 million
☐ 3. ☐ $25 - $49.9 million
☐ 4. ☐ $20 - $24.9 million
☐ 5. ☐ $10 - $19.9 million
☐ 6. ☐ $5 - $9.9 million
☐ 7. ☐ $1 - $4.9 million
☐ 8. ☐ $500,000 - $999,999
☐ 9. ☐ $499,999 or less

12 Estimated gross annual revenue of your entire company/institution: (check one only)

1. ☐ Over $10 billion
2. ☐ $1 to $9.9 billion
3. ☐ $500 to $999.9 million
4. ☐ $100 to $499.9 million
5. ☐ $50 to $99.9 million
6. ☐ $10 to $49.9 million
7. ☐ $5 to $9.9 million
8. ☐ $4.9 million or less

13 Estimated number of employees for your entire corporation:

1. ☐ Over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ 499 or less

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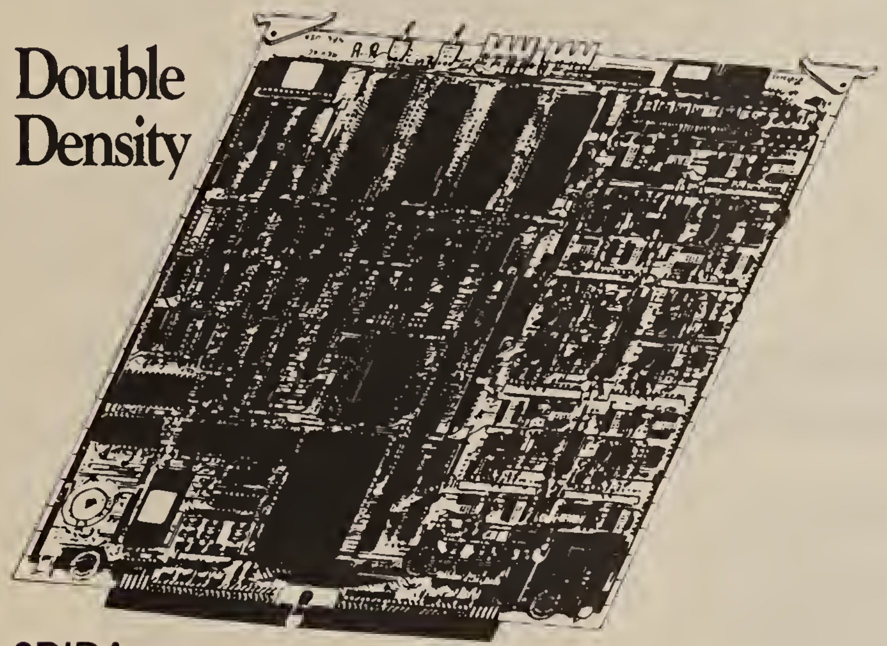

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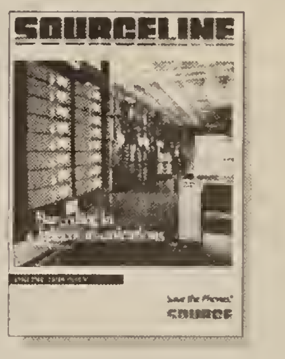

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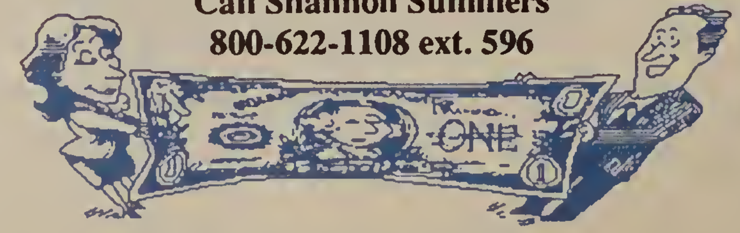

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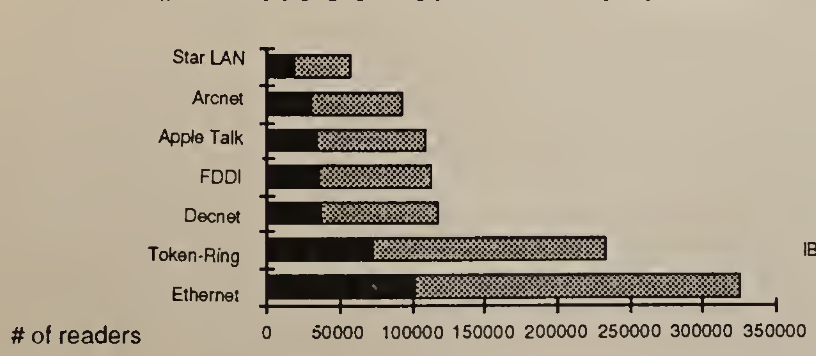
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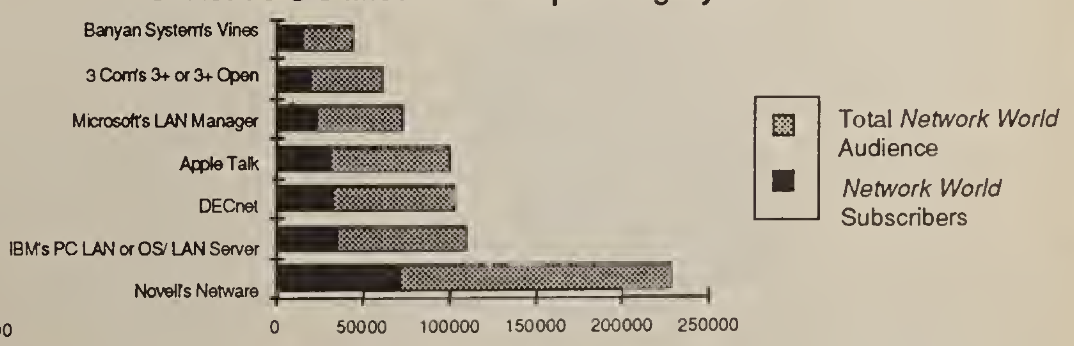
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Distributed DBMS primary functions

Company	Product	Processing functions												
		Query optimization (local)	Query optimization (global)	Read-only	Read from multiple sites/ Update from a single site	Delete from a single site	Delete from multiple sites	Locking (update)	Locking (delete)	Locking granularity (file)	Locking granularity (table)	Locking granularity (row)	On-line performance monitoring (local)	On-line performance monitoring (global)
Informix Software, Inc.	Informix-OnLine	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ingres Corp.	Ingres Intelligent Database	✓	✓[1]	✓	✓[1]	✓	✓[1]	✓	✓	✓	✓		✓	✓[1]
Oracle Corp.	Oracle 7	✓	✓	✓	✓	✓	✓[1]	✓[1]	✓[1]			✓	✓	✓
Sybase, Inc.	System 10	✓	✓[1]	✓	✓	✓	✓	✓	✓		✓		✓	

FOOTNOTE: (1) Offered as an optional feature

SOURCE *NETWORK WORLD*

The elusive illusion

continued from page 44

Ingres offers replication, while Sybase and Oracle have announced plans to support it — Sybase via its Replication Server and Oracle through a feature it calls snapshots.

Once data has been distributed, the ability to both find and use it is paramount. Global data dictionaries and directories are used to transparently locate the data and convert it into the correct format.

Shaku Atre, a partner with Coopers & Lybrand's Atre/Computer Assistance Division in Rye, N.Y., says data dictionaries store information about the data and its uses, applications and security features. Data directories are generally used by the DBMS and provide information about where the data is and how it can be accessed, says Atre, the author of *Distributed Databases, Cooperative Processing & Networking*, published by McGraw-Hill, Inc.

Dictionaries and directories are either local or global. Ingres is the only vendor shipping a product that provides global dictionary and directory functions, although the Sybase System 10 and Oracle 7 are expected to support the features, as well.

"Ingres/Star is the name of the product that manages the data dictionary" in Ingres' product, McGoveran says. "It does extracts of all the local data dictionaries and query optimization. But the shortcoming of this approach is that it relies on the central Ingres/Star node, and if that goes down, you no longer have access to the other nodes in the distributed database. You will have to establish another star node somewhere else."

Two-phase commit

Data distribution functions are indeed important, but the heart of today's distributed DBMSs is the two-phase commit protocol. This protocol manages the process of performing transactions on a database that spans several nodes.

The guiding principle of two-phase commit is this dictum: There should never be a case in which a transaction spanning multiple nodes is completed on some nodes but not on others. Either the whole transaction is completed or the whole transaction is aborted.

Sybase, Ingres and Informix currently support varying implementations of the protocol, while Oracle says it will support it in Oracle 7.

"Ingres and Informix both offer a more elegant two-phase commit implementation than Sybase in that both do two-phase commit at a single commit statement," Edelstein says.

This means that application programmers can implement two-phase commit with a single statement in applications written for Ingres and Informix. With Sybase, programmers must include a series of subroutine calls in each application in order to use two-phase commit. However, Oracle promises that its two-phase commit will be similar to Ingres' and Informix's.

Ingres, Informix and Oracle may provide a two-phase commit protocol that requires less programming but is less adaptable to various needs because it cannot be readily modified. With Sybase's offerings, it can be modified because programmers can tailor the implementation details of two-phase commit in the application.

Even though it has a more flexible two-phase commit, Sybase recently announced it plans to move away from the protocol. Instead, the company is proposing that users take advantage of System 10's optional Replication Server software as a replacement for two-phase commit.

With Replication Server, users designate a single node as the master controller of all updates. This node keeps a log of all updated data records and downloads a refreshed copy of the data record to the local sites.

Edelstein says this strategy means that failures at any one site won't block transactions. In addition, heavy traffic loads will be alleviated because this eliminates the many messages two-phase commit generates and transmits between nodes.

"This is a much simpler and more elegant solution" than two-phase commit, Edelstein says. "But there is a cost." Updates could be lost if the controller node fails, he says. "And there is a risk that during the two or five or 10 seconds — or however long it takes for the master to propagate the changes to all the sites — the data will be inconsistent. The real question is, Can you live with that level of inconsistency?"

Regardless of this risk, others agree that using Replication Server in place of two-phase commit is a good strategy.

"Sybase has recognized that what people really want is not complex distributed databases," McGoveran says. "What the overwhelming majority of people need is copies of data at multiple sites that are controlled from a central master. What Sybase has done with its Replication Server is provide a very nice facility for handling that problem."

While it is pushing the benefits of Replication Server, Sybase says it will continue to offer support for its programmatic two-phase commit.

Uncommitted user

Even though all four vendors are now committed to supporting two-phase commit, it is not necessarily a panacea for users who are somewhat shy about implementing it.

Percy Young, manager of store systems for clothing retailer Burlington Coat Factory Warehouse Corp. in Lebanon, N.H., says the basic premise of two-phase commit made the protocol unworkable for his business needs.

The firm has Oracle 6 DBMSs, which support only a few distributed functions, running on Sequent Computer Systems, Inc. systems with Sun Microsystems, Inc. workstations on the front end. Those workstations run Unix System Laboratories, Inc.'s Tuxedo on-line transaction processing monitor software and in-house queuing mechanisms.

"Because we carry a large line of clothing, we broke our database into divisional databases — coats in one, children's wear in another and so forth," Young says. "This would seem natural for two-phase commit because we typically have sales transactions that involve items from each database."

So Young did a comprehensive analysis of Orcale 7 and its implementation of two-phase commit.

"The basis of two-phase commit is that if one part of the transaction fails, all the parts fail," Young says.

But there are certain portions of most transactions that Burlington Coat cannot afford to have fail. For instance, if a customer pays with a credit card, the store sends part of the transaction to the bank for cash settlement and cannot afford to have that part fail.

Thus, two-phase commit's all-or-nothing approach did not meet Burlington Coat's business needs. Instead of using two-phase commit and moving to a distributed database, the firm kept using several autonomous databases. It developed a means to update each of these independently, thus mimicking a base-level distributed DBMS function.

Maintaining integrity

Another key issue to consider in evaluating distributed DBMSs is the method used to maintain referential integrity among data records that are dependent on a master entry for the data in certain fields.

For instance, a college might have a database with several tables — one for tuition information, one for class enrollment and one for grades. Each table uses the student's name as a common denominator. Referential integrity ensures that changes in any one table are reflected in all related tables. If a student's name changes, entering the new name

(continued on page 63)

IBM slow to deliver distributed DBMS

By Jim Brown
Managing Editor — Features

Perhaps one of the bigger players missing from the distributed database management system market is IBM, and that may be somewhat perplexing to some. IBM has been touting its Distributed Relational Database Architecture (DRDA) since June 1990 but has yet to deliver much of the functionality the architecture promises to provide.

DRDA is a set of guidelines IBM will use to build distributed features into four of its key DBMS products: DB2, SQL/DS, AS/400 Database Manager and OS/2 Extended Services Database Manager ("DRDA will help users juggle data," *NW*, May 4).

To date, IBM has added what it calls a remote unit of work (RUOW) feature to these DBMSs. RUOW lets a user of one DRDA-compliant DBMS extract and update data from another remote DRDA-compliant DBMS. IBM has yet to deliver its distributed RUOW, which will enable users to extract and update data from multiple sites at once.

"At this point in time, the amount of distributed functionality that IBM delivers is pretty minimal," says Herb Edelstein, a partner with Euclid Associates, a Potomac, Md., consultancy.

The four DRDA DBMSs can be tied together via IBM's Systems Network Architecture. Using a gateway capability, users of any DRDA-compliant DBMS can exchange data with any other DBMS.

IBM is working with Information Builders, Inc. to build a product called EDA/SQL, which will let any of the four DBMSs defined as part of DRDA access data stored in more than 50 other DBMSs, including ones from Digital Equipment Corp., Hewlett-Packard Co., Informix Software, Inc., Ingres Corp., Oracle Corp. and Sybase, Inc.

In addition to supporting SNA, OS/2 Extended Services Database Manager runs on OS/2-based clients and servers attached to Microsoft Corp. LAN Manager, IBM LAN Server or Novell, Inc. NetWare local-area networks.

The Application System/400 minicomputer-based AS/400 Database Manager can run over Transmission Control Protocol/Internet Protocol networks in addition to SNA. The mainframe-based SQL/DS and DB2 run over SNA networks.

IBM says DB2 can support the two-phase commit protocol, which is a key feature in a distributed DBMS. But that feature is not available in the other three DRDA DBMSs.

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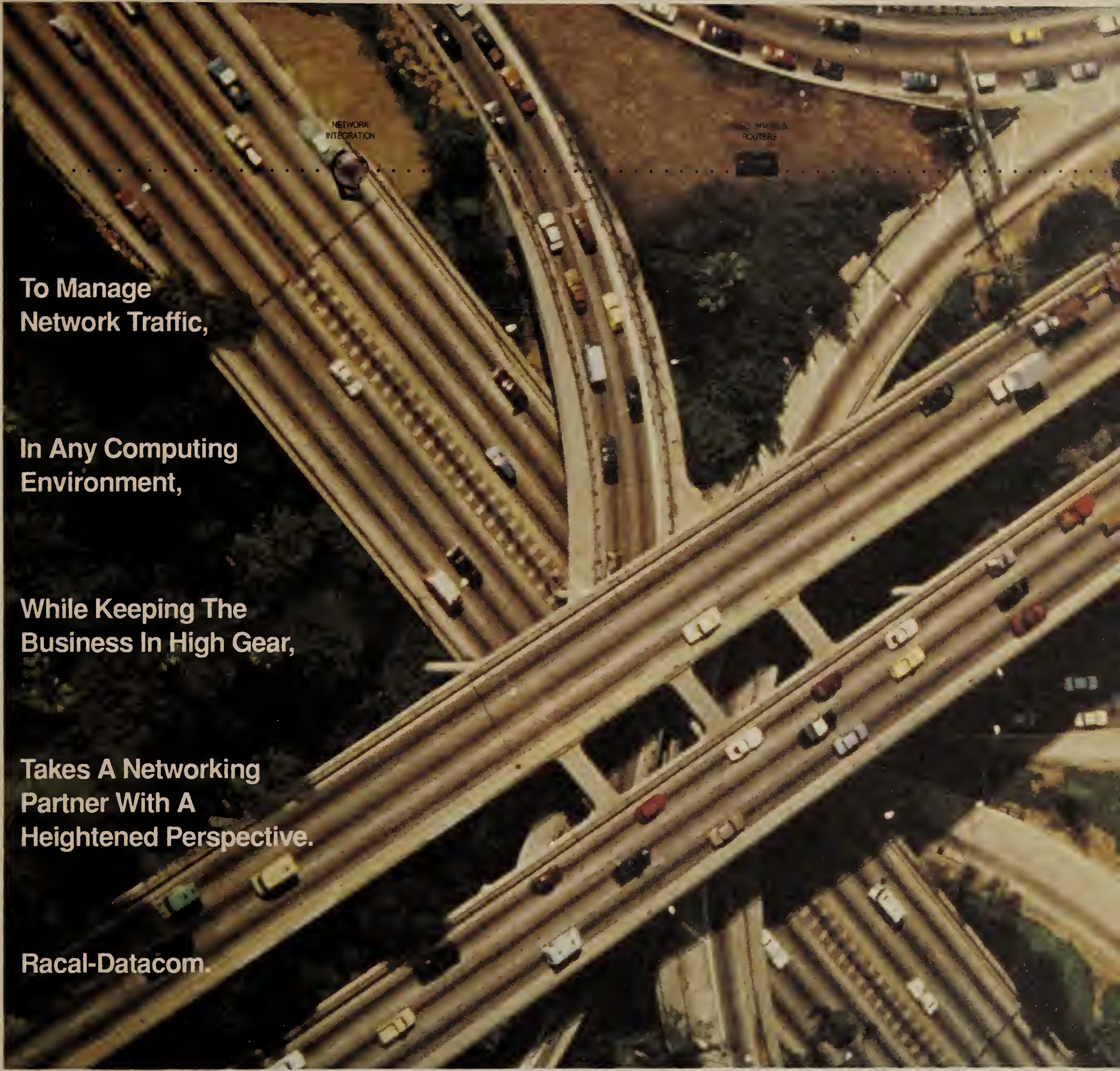
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Mobile wares bow at show

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addition, each user has complete control over the image, so both can add or erase in real time. Shared Whiteboard will also be available in the first quarter and will cost $99.

Multivendor support

Several other hardware and software vendors announced intentions to develop products based on the Hobbit chip. These vendors include portable personal computer makers NEC Corp. and Toshiba Corp., which separately said they will develop Hobbit-based personal communicator-type devices, and WordPerfect Corp., which plans to develop a pen-based version of its popular WordPerfect word processing application for the platform.

AT&T Easylink Services announced that a communications link to its AT&T Mail E-mail service will be bundled free with every version of PenPoint, and McCaw Cellular Communications, Inc. and RAM Mobile Data said they would support Hobbit-based personal communicators on their wireless data networks.

Gopher reduces complexity

continued from page 1

forward, we needed to provide something everyone could use and understand to help them be technologically literate," said Donald Riley, associate provost for academic affairs and director of computer and communications resources.

Although the university had originally considered shouldering the task of connecting the mail systems and bringing tens of thousands of new users on-line with a common electronic directory, it ultimately decided to job out the work to Control Data.

"Last June, we agreed to essentially scrap internal development in favor of the Control Data Mail*Hub, which we beta-tested for a year," Riley said. The product runs on Control Data's CD4000 line of Unix Reduced Instruction Set Computing-based computers.

Mail*Hub provides the translation needed to link the school's existing E-mail systems, which include the Transmission Control Protocol/Internet Protocol-based Simple Mail Transfer Protocol, Digital Equipment Corp.'s All-In-1, IBM Professional Office System, the Unix-to-Unix Communications Protocol, and the Post Office Protocol for connecting PCs and Macintosh computers.

It also supports the new Internet Multipurpose Internet Mail Extension (MIME) standard and provides a Group III facsimile gateway, which converts PostScript, plain text and digital-image formatted images into fax. New users at the university will be equipped with native X.400 mail.

With Mail*Hub, X.500 and X.400 applications run over both TCP/IP and Open Systems Interconnection lower layers — putting the university on the road to OSI while allowing coexistence with TCP/IP.

Its TCP/IP support follows the version promulgated by the London-based industry and academic group called International Standards Organization Development Environment (ISODE). ISODE, whose software definitions ensure that application-layer protocols work over both OSI and TCP/IP lower layers, has no formal connection to the ISO standards body.

Lee Croatt, director of computing and information resources at the university, said the installation of the new system, which took about a month, was generally trouble-free.

Through the Gopher interface to the campus X.500 directory, users can key in names to search for address information. The university directory interoperates with the Internet's X.500 pilot directory and the X.500 system deployed by the University of Michigan.

Although the X.500 software can also provide lookup and display of digitized photos, the university has not yet taken advantage of this feature since the staff is still busy pumping student data into the directory and double-checking its accuracy.

But Croatt said the digitized photos in the X.500 directory could be a tool for the bursar's office to verify student identification, if needed. "If you have duplicates of names, photos would eliminate the problem," he said.

The entire network can be managed from the host X.500 node, where the routing information for the message handling, fax and mail applications resides. "Our focus is to build a system based on standards as the foundation," Croatt said. "If we centralize and standardize it, we're going to save a lot of money."

The university tailored the system by installing the client/server-based Gopher software as the common user interface to X.500. The copyrighted software, which is available at no charge on a variety of computer platforms to academic institutions, is used to browse Internet databases or perform full-text search and retrieval.

Gopher has been loaded onto about 500 Internet servers since its creation a year ago, according to Mark McCahill, the university's manager of distributed computing and Gopher project leader.

The elusive illusion

continued from page 60

in one table will result in the new name being changed in all other tables.

There are two methods used to provide referential integrity — triggers and ANSI-standard declarative structures.

All four vendors support triggers, although only Sybase and Ingres allow programmers to use them to ensure referential integrity.

Triggers are typically used to establish business rules within applications and, therefore, must be programmed into applications. For example, a trigger could set off an action to check the master record when one of the dependent records is called up to make sure the data in both is accurate.

Declarative structures allow referential integrity to be written into the database definition and automatically performed. This enables programmers to build a dependency table once and avoid having to code triggers into applications. Every time a dependent record is called up, the declarative structure would automatically consult the master.

Informix, Oracle and Sybase all say they support declarative structures.

The key difference is that triggers allow one to optimize performance, whereas declarative structures are more accurate and consistent, says Richard Finkelstein, president of Performance Computing, Inc., a consulting company in Chicago.

"Suppose you are updating a student record because [the student] is adding a class," Finkelstein says. "If you use declarative structures, every time you add a new class, it would check to see whether the student existed. So if the student adds 10 classes, there are 10 checks.

"A smart programmer could use triggers to check the student [record] once, lock the record to make sure no one changes it while you are doing your updates, and then you can add those 10 classes," he says.

"With declarative structures, the database, rather than the programmer, enforces the rules," Finkelstein says. "But it cannot be as smart as the programmer about the specific logic involved. Sometimes, especially in a WAN environment, it is necessary to do it programmatically to get reasonable performance."

Decision making

Because of the differences in distributed DBMSs, consultants espouse varying approaches to how users should evaluate the products. The one word of advice universally given is that users should carefully analyze a product's features and performance to make sure it will meet their business needs.

> "With declarative structures, the database, rather than the programmer, enforces the rules. But it cannot be as smart as the programmer about the specific logic involved," Finkelstein says.
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Coopers & Lybrand's Atre says the products available today are generally not up to the performance standards required by mission-critical applications. But she says the first step in choosing among them is to comprehensively map out one's environment from the front end to the back end with all of the networks in between. This will rule out certain products that do not offer support for what the user either has installed or intends to install.

"Users will have to figure out which product comes closest to fitting into their environment and meeting their needs, although none will be a perfect fit," Atre says.

Finkelstein says two key areas potential users need to analyze are performance and administration.

"In a distributed environment, there are lots of messages being passed back and forth over the WAN used to set up queries, handle lock management and so on," Finkelstein says.

"Very often," he says, "there are so many of these messages, it causes responses to deteriorate to such a point that it is no longer practical to use the system. This problem is highlighted by the fact that most of these systems can barely provide adequate performance on high-speed LANs, much less in a distributed network, where you are dealing with low-speed lines."

Finkelstein offers a word of caution to users about to jump on the distributed DBMS bandwagon. "I don't want to lead people astray by saying these products are really optimized for anything yet," he says. "I haven't seen one of them used in any practical way. I know of a couple of companies that were going to use two-phase commit but then decided not to. These [features] are the grains of some future technology."

But with new versions of the Sybase and Oracle DBMSs on the horizon and other vendors promising delivery of distributed DBMS features, now seems to be as good a time as any for users to start evaluating whether a distributed DBMS is in their future.

Nitzsche is an associate features editor for Network World.

Group takes aim at BBS villains

continued from page 8

Holleyman said the BSA, in coordination with U.S. law enforcement agencies, will be going after bulletin board operators actively selling stolen software as well as those who may not be aware that users have uploaded stolen software. "And we're keeping our options open to go after the users, too," he said.

The get-tough announcement from the BSA elicited reaction from the Electronic Frontier Foundation (EFF), a group that has been active in ensuring protection of civil liberties in an electronic environment.

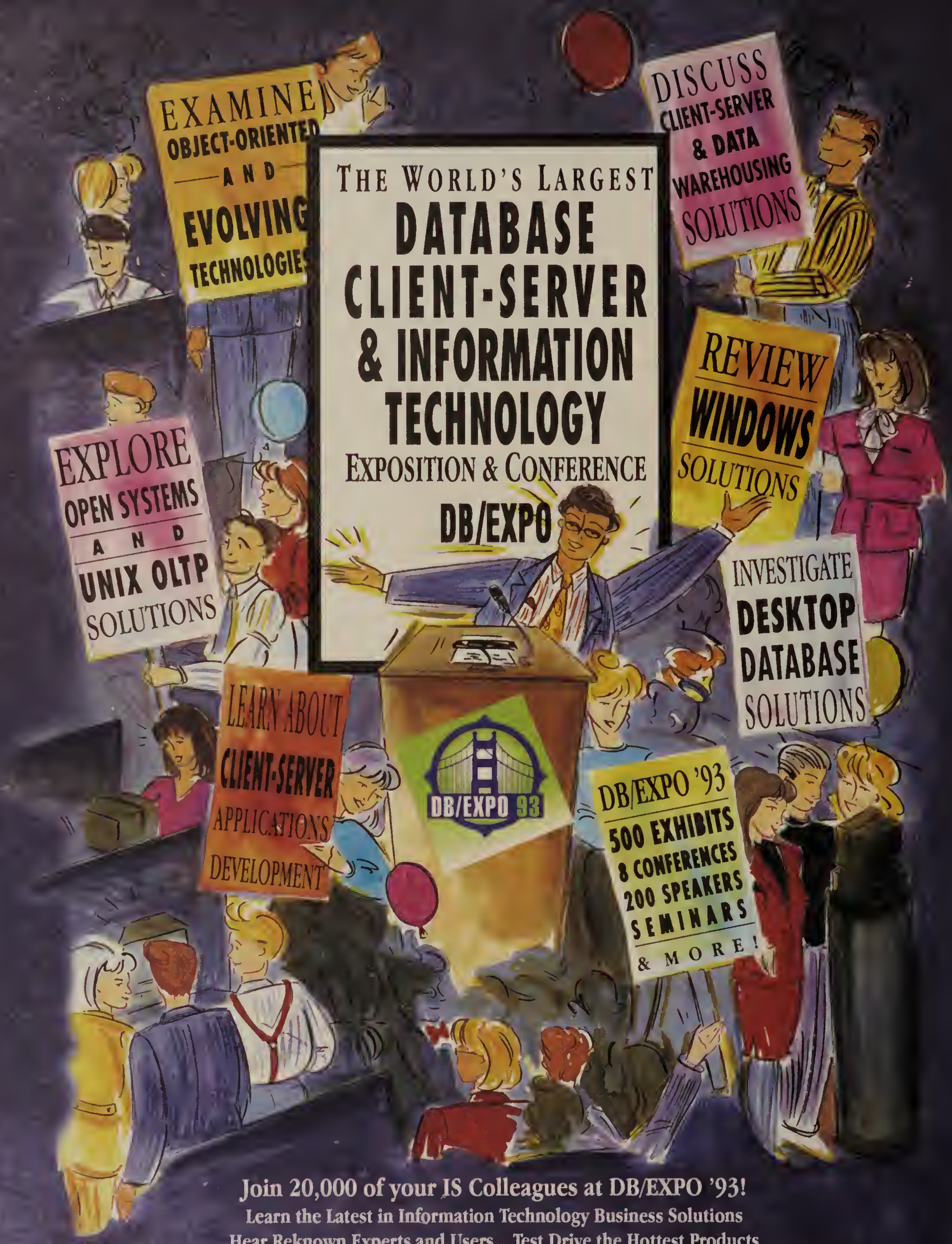
"It's a source of concern that the BSA might hold bulletin board operators responsible for stolen software they were unaware of," said Shari Stele, staff attorney at the EFF office here.

Stele said she is doubtful that operators pleading ignorance could be prosecuted under the new criminal law.

"It's got to be clear for criminal copyright sanctions to take effect that there was knowing distribution," she said. Stele conceded, however, that the concept of negligence pertains to bulletin board operators just as it does to everyone else.

"The issue is one of proof," Holleyman said. "It may not be a clear-cut activity. It's likely this area of the law will be tested."

When asked if the BSA is considering a "sting board" operation in this country. Holleyman replied, "I can't comment on that."



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AT&T adds high-speed net links

continued from page 1

AT&T is the second of the top four carriers to offer fractional T-3. WilTel began offering the service in September 1990, while Sprint Corp. last week said it plans to roll out a service between T-1 and T-3 sometime in 1994 but would not provide further details.

MCI Communications Corp. declined comment.

AT&T will begin beta tests of the services next month, offer a controlled introduction in the first quarter of 1993 and make them generally available through at least 100 of points of presence by mid-1993, Vaidya said. Further deployment will be based on demand.

Pricing details

Although the carrier has not yet established pricing for the fractional T-3 services, the cost will be substantially less than leasing the equivalent number of T-1 lines, Vaidya said.

AT&T will charge users a fixed per-mile fee and a monthly charge, rather than use mileage bands.

Users can access the service via multiple T-1s by using inverse multiplexers or via T-3. Vaidya stressed that AT&T is currently pressing local telephone companies to offer T-3 access, which could be key to the service's success.

"Without affordable [T-3] access, the savings from the interoffice channel will be nullified," said Len Evenchik, director of data communications for the commonwealth of Massachusetts. "This will become a big concern for users."

AT&T said the fractional T-3 services offer several benefits over parallel T-1 lines.

For instance, the carrier said it will provision the lines faster than T-1 lines — which take 25 business days end to end or 15 business days for the interoffice segment — although it would not give specific provisioning intervals.

The carrier will also assign the fractional T-3 links a higher priority in the event of outages.

Users will realize better performance from fractional T-3 service than from multiple T-1 links because separate links are often-times established over network routes of different lengths, Vaidya said. Using multiple T-1s also requires the use of inverse multiplexers to logically pool the circuits.

AT&T will allow users to combine fractional T-3 service usage with usage from fractional T-1, T-1, T-3 and AT&T's Dataphone Digital Service for maximum discounts under its Multi-Service Volume Pricing Plan. The carrier will also offer term plans but has not yet determine their length, Vaidya said.

Where to find them

The new services will be available with the carrier's Enhanced Diversity Routing Option, under which AT&T primary and secondary circuits are routed over physically diverse paths.

AT&T's fractional T-3 service will also come with the carrier's Service Assurance Warranty, under which the carrier will credit up to 50% of the monthly end-to-end circuit cost for a single interoffice channel failure of at least two minutes.

Carriers plan pan-Europe net

continued from page 1

CCITT and European Telecommunications Standards Institute specifications.

The carriers will install at least one switch in each country and connect them using 34M bit/sec links in the first quarter of 1994, said Igor Douplitzky, broadband product market manager for France Telecom in New York. They are scheduled to begin field trials with selected users in the second half of that year.

If all goes well, the carriers will make services over this net generally available in early 1995, although they are not saying what speed they will be.

Douplitzky said the experience gained in the tests will help carriers quickly and smoothly deploy ATM-based services.

"There are already companies that want international services that are faster than E-1," he said. "This network will enable [carriers] to address their needs."

Added Len Elfenbein, president of Lynx Technologies, Inc., a Little Falls, N.J., firm that designs and implements global networks, "It's wonderful that these carriers are evaluating ATM. ATM is the key to the future of carrier networks around the world."

The idea also met with approval from big U.S. companies. "We're very encouraged by this," said Jeff Price, transmission voice and video manager for Hewlett-Packard Co. in Palo Alto, Calif. "This gives us hope for quicker provisioning of high-speed international services."

Jack Haverty, network manager at Oracle Corp., added, "If they plan to offer services that handle large bursts of data, I'd take a hard look at what they have."

Although several of the carriers are already conducting ATM field tests, experience gleaned from these trials will be used to deliver national, not international, ATM-based services.

"That's why this international ATM network is so important," Douplitzky said. "We need to show the European Community that the equipment we deploy in our networks can be interconnected to offer a new generation of international services."

One capability that will be explored is what the carriers refer to as "virtual path," or how ATM switches from different vendors will establish virtual traffic-carrying circuits. Virtual circuits could also be used to link different carriers' ATM networks.

The group wants to define technical specifications for ensuring interoperability between separate networks "at the virtual path level."

European carriers are already working together on some large-scale network projects, including a pan-European data network begun in July ("European carriers unite in continental network effort," *NW*, July 13).

Wellfleet to offer SNA enhancement

continued from page 4

is required with SNA.

With the software, a net administrator can assign priority levels, based on such criteria as application and destination address, and the router will essentially mark each packet with a high, medium or low priority.

Proteon, Inc. is expected to announce in December similar SNA prioritization features, while Cisco Systems, Inc. and Cross-Comm Corp. have already outlined such schemes.

Releases 7.50 and 7.60 will be available free to subscribers of Wellfleet's software program.

What the future holds

Other Wellfleet SNA enhancements over the next two years will include software that lets the router locally acknowledge receipt of token-ring packets on behalf of the remote devices to which the packets are destined. That prevents SNA acknowledgment and polling data from clogging wide-area links and helps SNA sessions remain active even if the link fails.

Barton said this feature will be compatible with IBM's DLS, a proposed standard for locally acknowledging receipt of SNA frames and handling link-layer flow control.

A second feature, dubbed Directed Broadcast, will let users more efficiently transport NETBIOS traffic through internets by enabling bridges to learn the location of remote nodes, rather than using broadcasts to find destination addresses.

Wellfleet said it will later add translation bridging capabilities on its gear to support bridging between token-ring and Ethernet LANs. The company is also committed to giving its routers support for IBM's APPN Network Node specification, Barton said.

David Passmore, vice-president and service director at Gartner Group, Inc. in Stamford, Conn., said Wellfleet's SNA plans are similiar to and as ambitious as rival Cisco Systems, Inc.'s except in two key areas.

Wellfleet took a different tack from Cisco by obtaining SDLC-to-token ring gateway technology from Netlink, Inc. ("Netlink and Sync Research enhance their SNA gateways," *NW*, Oct. 26). Cisco is developing homegrown software for legacy IBM Synchronous Data Link Control devices.

Wellfleet also differs in its commitment to support IBM's DLS and APPN. Cisco has proposed its own IP-based alternative to APPN, although the company said it will also support APPN. Wellfleet has no plans to support Cisco's APPN version.

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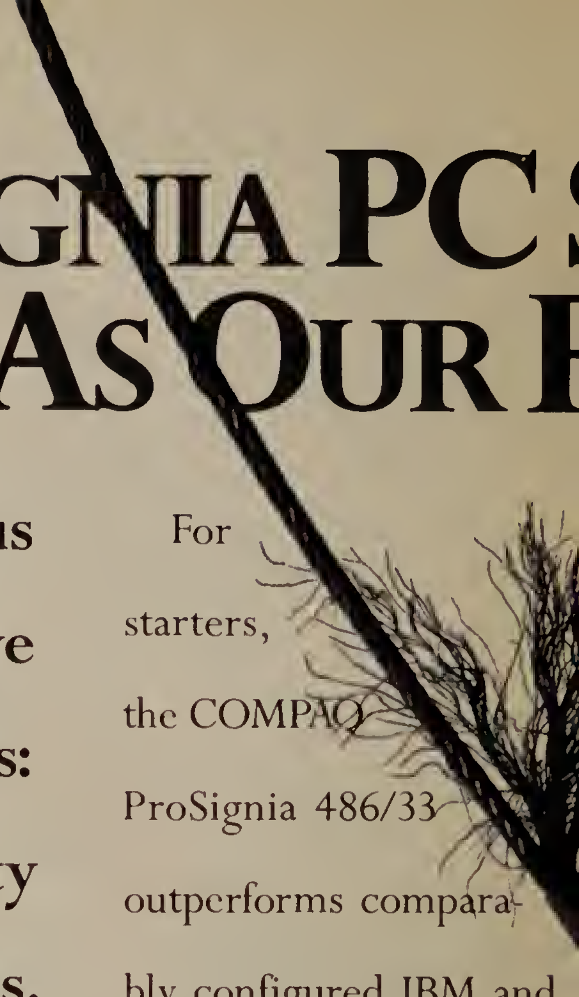
THE COMPAQ PROSIGNIA PC
THE SAME IMPACT AS OUR



Not long ago, we introduced PCs that established us as the new leader in affordable computing. To that we now add the COMPAQ ProSignia Family of PC Servers: delivering a new level of performance, affordability and support by establishing a new class of PC servers.

Ironically, the more critical your PC network becomes, the more likely your network server will prove inadequate.

The faster you need something, the slower it delivers. When it's time to upgrade or expand, you find yourself at the technological equivalent of a dead-end street.

Which, needless to say, can be a problem.

What you need is an easy-to-manage system offering high performance, flexibility and extended support. All at an exceptional price.

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In still other words, the new COMPAQ ProSignia.

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For starters, the COMPAQ ProSignia 486/33 outperforms comparably configured IBM and Dell servers by 83% and 64%, respectively.* (Both of which, by the way, are much more expensive.)

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COMPAQ ProSignia disk-configured models come standard with an all-new 32-Bit Fast-SCSI-2 Controller that performs twice as fast as old SCSI technology. As well as a preinstalled, COMPAQ 32-Bit NetFlex Controller that works with Ethernet or Token Ring. And for those who require truly

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extraordinary capabilities, we offer an optional 32-Bit IDA-2 Controller.

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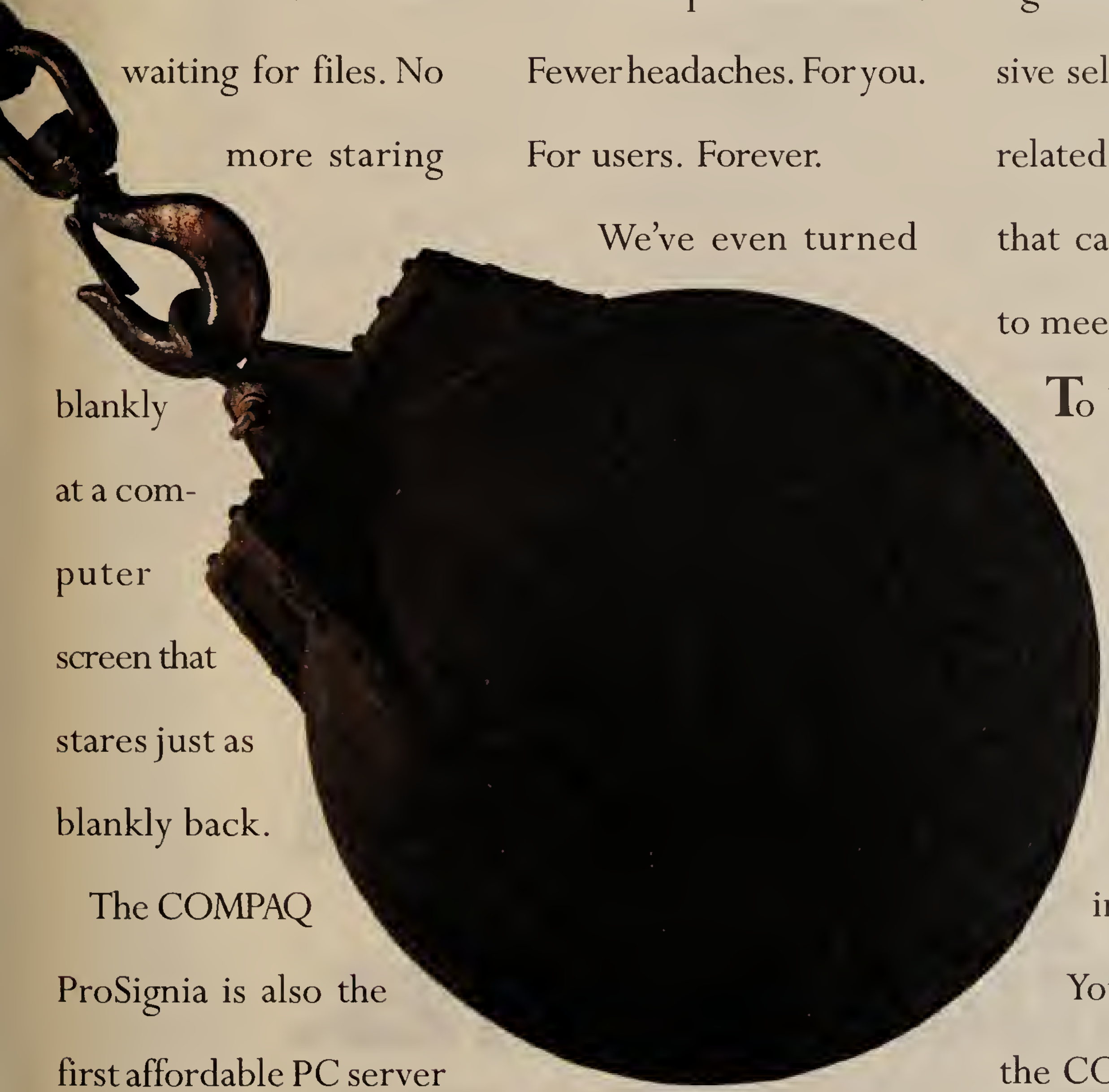

The COMPAQ ProSignia is also the first affordable PC server incorporating advanced management technologies. Included is a set of simple-to-use features that not only help you maintain better control over your entire network, but can also anticipate, and help prevent, potential problems.

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CompaqCare also now includes our optional Advanced Network Support Agreement, a comprehensive selection of systems-related support services that can be customized to meet your needs.

To learn how easy it is to get up and running, just call 1-800-345-1518 in the U.S., or 1-800-263-5868 in Canada.

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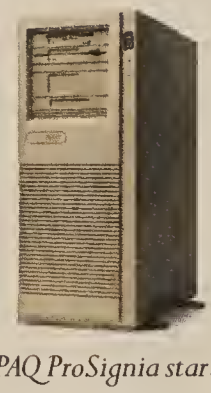

The COMPAQ ProSignia starts at under $\$2,700^{\dagger}$ *and is designed, tested and certified to run NetWare flawlessly. We even offer NetWare from Compaq to optimize server management capabilities.*

intel inside

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COMPAQ

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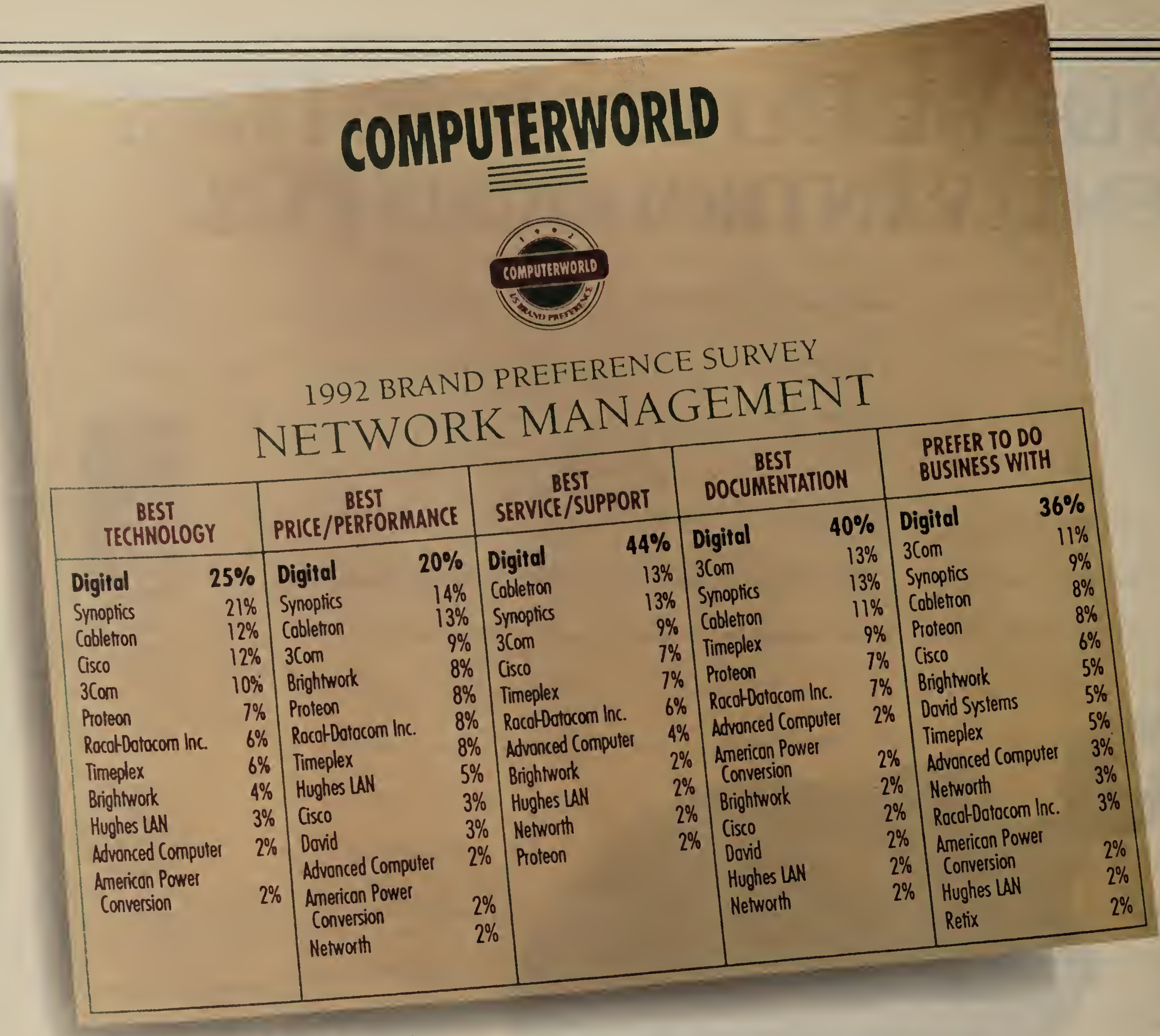

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Dear *Network World* reader:

Attached to this week's issue, you'll find an entry form for the International Communications Association/*Network World* Call for Innovation program. We hope you'll take advantage of this opportunity to participate in this exciting program designed to recognize network professionals for their innovative work.

Through the Call for Innovation, the ICA and *Network World* honor network professionals within the user and academic communities for the creative application of network technology to solve problems and create new business opportunities.

Call for Innovation is your forum for sharing with peers the innovative network solutions you've developed. Users who are recognized for their extraordinary work will present their projects to the ICA membership and other network professionals during a special feature session at the ICA COMNET Dallas '93 conference in May. The ICA will also publish a journal of all qualified papers.

Please take a few minutes to fill out the attached entry form, which is also a prepaid mailer. If the form is missing, call *Network World* at (800) 622-1108 or ICA at (800) ICA-INFO for details.

Don't delay. Get into the running today for the Seventh Annual Call for Innovation program. All entries must be received by December 31, 1992.

Sincerely,

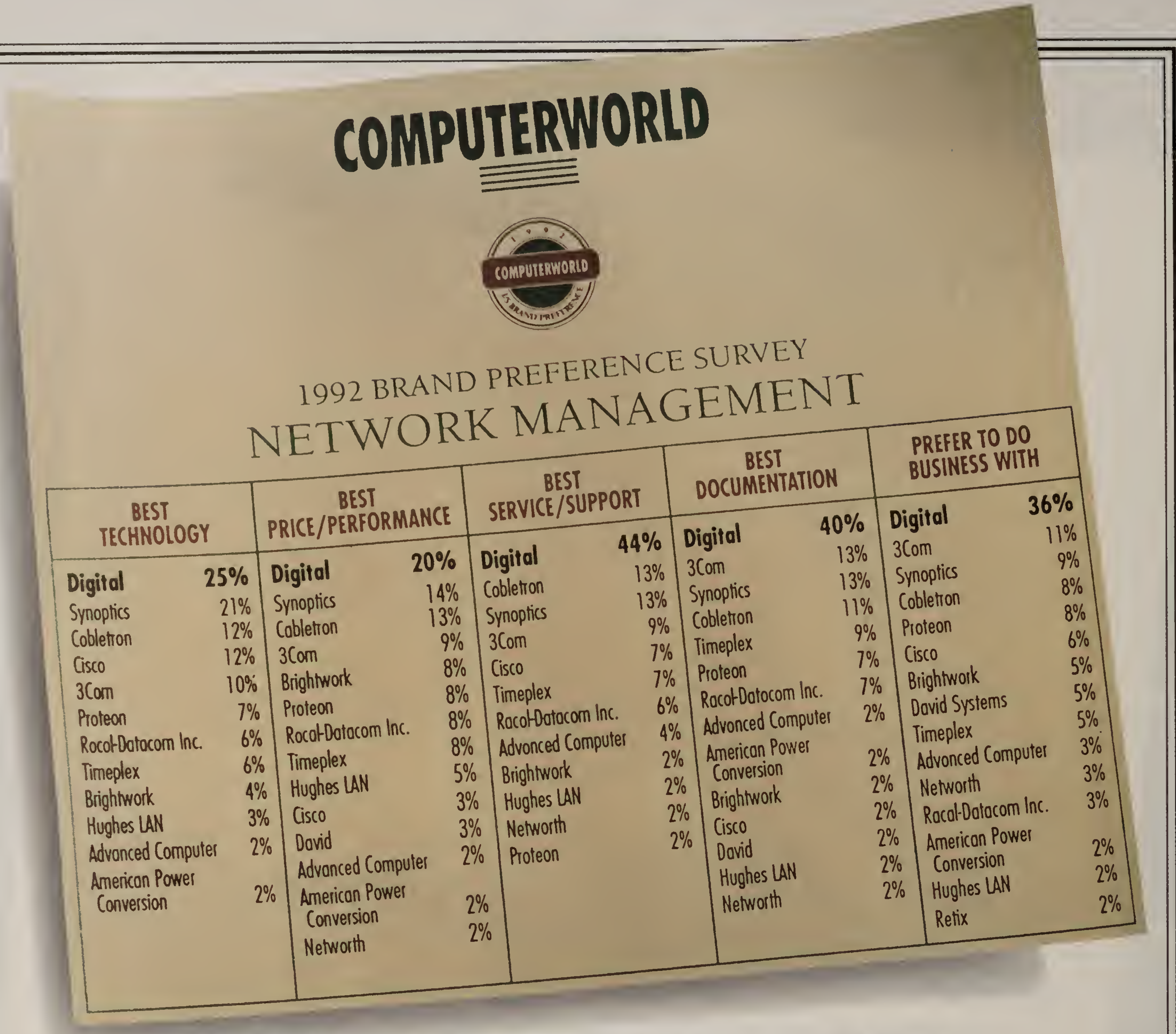
John Gallant

John Gallant
Editor

Mary Lou O'Neill

Mary Lou O'Neill
ICA Technical Programming Committee

Call For Innovation



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The ICA will publish a journal of all qualified Call for Innovation papers. In addition, Call for Innovation participants will be able to share their experiences with peers in a one-on-one setting on the exposition floor during special "Poster Sessions" at the ICA COMNET Dallas '93 conference. **All entries must be received by December 31, 1992.**

How does it work?

Submit a 150- to 250-word abstract describing your work in one of the following categories. The abstract should focus on the unique aspects of your project.

1. An innovative application of network technology to solve a problem or gain a competitive advantage. The problem resolved or the competitive advantage gained should be clearly described.

2. Work you've undertaken with a vendor to develop a new product or service needed by your company. The product or service innovation should be clearly defined.

3. Actions taken by your company that had a material influence on the standards-setting or regulatory process. Clearly describe the impact of your efforts.

4. Original research conducted in your organization that resulted in new applications for technology. The application and research methodology should be clearly outlined.

1. Name ______________________

Title ______________________

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Please write or type your abstract in the space provided above and drop this prepaid mailer into the mail. You may also fax your submissions to *Network World* at (508) 820-3467. Please be sure to fill out your name, title, address and telephone number. If you qualify, you will be contacted by a representative of ICA or *Network World* for additional information. **All entries must be received by Dec. 31, 1992.**

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Kevin J. Conlin and
Harry Alcoba
Harris Corp.

•

David M. Nevers
United Air Lines, Inc.

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Donald C. Augustin
and Cheryl Diller
McDonnell Douglas
Corp.

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R. Stephen Blaney and
James J. Sobszak
Westinghouse Electric
Corp.

•

H. Glen Runyon
McDermott
International, Inc.

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Dr. Raymond K. Neff
Case Western Reserve
University

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Steven Levy and
Edmond Zaharewicz,
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John Crankshaw
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Emil J. Mikulas
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